



Solid Phase Extraction Products



About Phenomenex

Phenomenex is a global technology leader committed to developing novel analytical chemistry solutions that solve the separation and purification challenges of researchers in academic, pharmaceutical/biopharmaceutical, biotech, environmental, clinical research, government, and industrial laboratories.

From drug discovery and pharmaceutical development to food safety and environmental analysis, Phenomenex chromatography solutions accelerate science and help researchers improve global health and well-being. Agela, as its dedicated local sub-brand in China, works in tandem with Phenomenex to deliver these robust and reliable tools to researchers.

Phenomenex is an operating company within the Life Sciences group of Danaher Corporation.



Food
Medicine Environment
Clinical
Consumption Goods
Administration of Justice
Chemical
Synthesis

////////////////////

• Dedicated Column for Textile Detection	082
Cleanert SLE-OD Dedicated Column for Azo Dye.....	082
Agela General Preparation Column	084
Polymer Matrix.....	084
Cleanert PEP	084
Cleanert PEP Plus	085
Cleanert PEP-2.....	086
Cleanert PAX	087
Cleanert PCX	088
Cleanert PWAX	089
Cleanert PWCX.....	090
Cleanert LCX	090
Cleanert PS	091
Silica Matrix.....	092
Cleanert S C18 (Endcapped)	092
Cleanert S C18-N (Non-Endcapped)	093
Cleanert S AQ C18 Hydrophilic Series	094
Cleanert S C8	094
Cleanert Phenyl	095
Cleanert CN.....	095
Cleanert NH ₂	096
Cleanert PSA	097
Cleanert SAX	098
Cleanert SCX	099
Cleanert COOH	100
Cleanert PRS	100
Cleanert SH.....	101
Cleanert Silica.....	101
Cleanert Diol	102
Cleanert C8/SCX	102
Adsorption Matrix	103
Cleanert Florisil	103
Cleanert PestiCarb	104
Cleanert Alumina A.....	105
Cleanert Alumina B.....	105
Cleanert Alumina N	106
Cleanert IC Ion Chromatography Preparation Column	107
Immunoaffinity Column	108
SPE Empty Tubes and Frits.....	109
Solid Phase Extraction Accessories and Devices.....	109
96-Well Collection Plates and Silicone Sealing Mats.....	110
Large Volume Loading Tubes/Devices	110
12/24 Position Vacuum Manifold Set and Accessories.....	111



Introduction to Solid Phase Extraction Products

Categorized by Sorbent

(1) Silica-Based Sorbents: C18 (endcapped), C18-N (non-endcapped), AQ C18, C8, CN, NH₂, PSA, SAX, COOH, PRS, SCX, Silica, Diol.

Commonly used sorbents in SPE are silica or bonded silica (with different functional groups bonded to the silanol groups on the silica surface). Its pH applicable range is 2.0~8.0. There are various types of bonded silica based sorbents, offering the advantage of multiple selectivity options.

(2) Polymer-Based Sorbents: PEP, PEP-2, PAX, PCX, PWAX, PWCX, and PS.

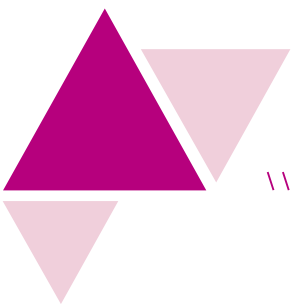
Polymer materials are obtained by copolymerizing pyrrolidone and divinylbenzene. The introduction of polar functional groups from pyrrolidone allows for balanced adsorption of various polar and non-polar compounds. Compared to C18 columns, these polymers offer the following advantages:

- They can be used over a pH range of 0-14, without the need for strict control of the activation process, and drying the cartridge does not affect its performance;
- They can simultaneously adsorb compounds of different polarities;
- Compounds containing basic groups will not have poor elution or low recovery due to interactions with silanol groups.

(3) Adsorption sorbents: Florisil (magnesium silicate), PestiCarb (graphitized carbon), and alumina (Alumina-N, neutral; Alumina-A, acidic; Alumina-B, basic).

(4) SLE (Supported liquid extraction) products utilize chromatographic-grade diatomite as the carrier for liquid samples and simulate the liquid-liquid extraction process through elution with organic solvents. It eliminates emulsification, requires no laborious shaking, and enables automated operation.

(5) Mixed and Dedicated Columns: PestiCarb/NH₂, PestiCarb/PSA, SAX/PSA, NANO (carbon nanomaterial purification products), TPT (dedicated column for pesticide residue detection in tea), TPH (dedicated column for pesticide residue detection in Chinese herbal medicines), BAP (dedicated column for benzopyrene detection), PAH (dedicated column for polycyclic aromatic hydrocarbon detection), PWAX (dedicated column for synthetic colorant), PA (polyamide decolorization column), PAE (dedicated column for phthalate detection), EC (dedicated column for ethyl carbamate), MCPD (dedicated column for chloropropanol detection), SYR (dedicated column for honey syrup identification), DNPH (aldehyde and ketone gas sampling tubes), ACA (dedicated column for acrylamide detection), EPH (dedicated column for hydrocarbon detection), and SLE-OD (dedicated column for azo dye).



(6) MAS-QuEChERS

The MAS-QuEChERS series utilizes the principle of sorbent-dispersed solid-phase extraction to achieve rapid detection methods for pesticide and veterinary drug residues.

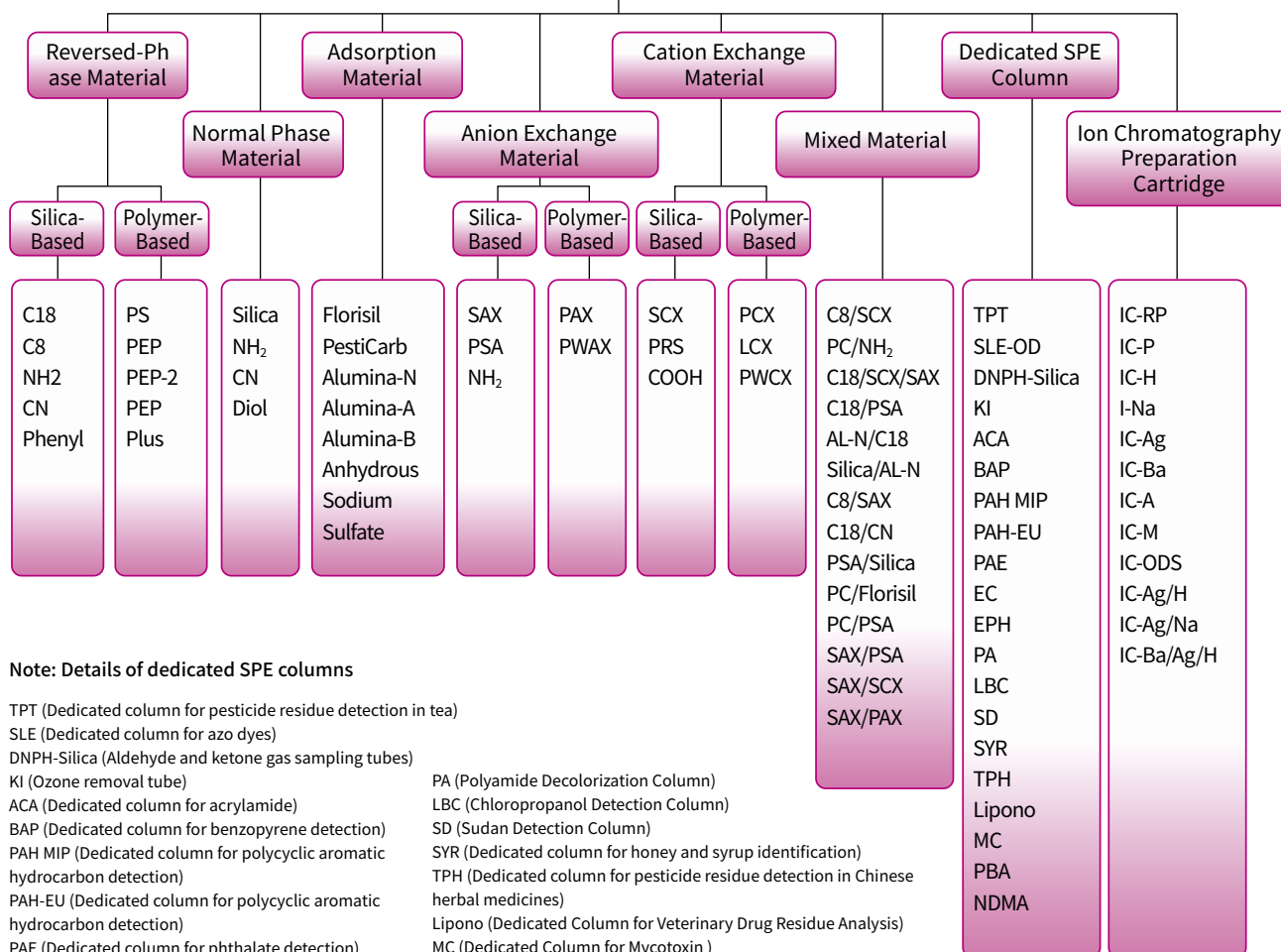
(7) MAS-C

The MAS-C series primarily utilizes 96-well plate MAS products to remove proteins and phospholipids in drug analysis. This series employs sorbents with specific adsorption capabilities for endogenous impurities, such as phospholipids, and achieves simultaneous protein precipitation and drug extraction through a special frit design.

(8) Preparation columns for ion chromatography: IC-RP, IC-P, IC-H, IC-Na, IC-Ag, IC-Ba, IC-A, IC-M, IC-Ag/H, IC-Ba/Ag/H, IC-Ag/Na, and IC-ODS.

Cleanert IC series ion chromatography sample preparation cartridges utilize high-purity sorbents and the principles of reverse-phase adsorption and ion exchange to effectively remove organic compounds and impurity ions from samples, thereby preventing contamination of the ion chromatography column by interferents and minimizing their impact on separation.

Cleanert SPE Material Classification



Note: Details of dedicated SPE columns

TPT (Dedicated column for pesticide residue detection in tea)

SLE (Dedicated column for azo dyes)

DNPH-Silica (Aldehyde and ketone gas sampling tubes)

KI (Ozone removal tube)

ACA (Dedicated column for acrylamide)

BAP (Dedicated column for benzopyrene detection)

PAH MIP (Dedicated column for polycyclic aromatic hydrocarbon detection)

PAH-EU (Dedicated column for polycyclic aromatic hydrocarbon detection)

PAE (Dedicated column for phthalate detection)

EC (Dedicated column for ethyl carbamate)

EPH (Dedicated column for hydrocarbon detection)

PA (Polyamide Decolorization Column)

LBC (Chloropropanol Detection Column)

SD (Sudan Detection Column)

SYR (Dedicated column for honey and syrup identification)

TPH (Dedicated column for pesticide residue detection in Chinese herbal medicines)

Lipono (Dedicated Column for Veterinary Drug Residue Analysis)

MC (Dedicated Column for Mycotoxin)

PBA (Dedicated Column for Ribavirin)

NDMA (Dedicated Column for Nitrosamine)

Categorized by Product Type

(1) Solid-phase extraction column (as shown in the figure)

Types of Solid-Phase Extraction Column	Features	Usage and Advantages	
Syringe SPE column	With flange	This traditional style column is compatible with both vacuum manifold sets and automated instruments. It is easy to place on test tubes and widely used.	
	Flangeless round edge	Commonly used in automated equipment, saving space and easy sealing.	
LRC column	Features a larger empty column volume	Suitable for specialized applications requiring a small amount of sorbent but a larger volume of elution solvent.	 LRC column

- Common solid phase extraction columns consist of three parts: a medical-grade polypropylene tube, a porous polyethylene frit and sorbent.
- Common specifications: 100 mg/1 mL, 200 mg/3 mL, 500 mg/3 mL, and 1 g/6 mL.
- Disposable: To avoid cross-contamination and ensure reliable detection, SPE cartridges are typically disposable.

(2) 96-well Plates

96-well plates are high-throughput SPE products. Each well contains a small amount of sorbent (10–100 mg) and has a sample loading capacity of approximately 2 mL per well. They are primarily used for the purification processing of small volumes of multiple samples in the biological and pharmaceutical industries, and are often used in conjunction with automated sample handling devices.



(3) 96-well Microplates

The 96-well microplate features cartridges that can be independently installed, removed, and freely arranged on the base plate. Users can employ individual cartridges or create custom configurations by combining cartridges of the same or different sorbents, tailored to specific experimental needs, significantly reducing costs. The column tubes are designed similarly to pipette tips, enabling them to be filled with small sorbents. With a packing volume as low as 2 mg, these microplates are ideal for processing small-volume biological samples. The elution volume can be as low as 25 µL, eliminating the need for concentration and volume readjustment steps, which significantly simplifies operation.



(4) 96-well Deep Well Plate

The increased column volume accommodates larger sample and eluent volumes, simplifying operation. Its detachable, modular design allows for the selection of various sorbents on a single plate, facilitating method development.



(5) Ion Chromatography Preparation Column

Specifically designed for ion chromatography detection, this column offers simple and easy operation. The Luer ports on both ends allow for direct syringe connection, enabling the purification of liquid samples or extracts by pushing them through the cartridge under pressure.



(6) MAS-QuEChERS Series Rapid Purification Tubes

This series offers a variety of purification tubes compliant with AOAC and EN methods, available in three centrifuge tube sizes: 2 mL, 15 mL, and 50 mL. They contain different ratios of PSA, C18, graphitized carbon, and anhydrous magnesium sulfate. The accompanying buffered salt extraction packs are designed in a sealed packet, ready for immediate use upon opening.



(7) Sorbent

Suitable for diverse customer needs, we provide sorbent in various package sizes ranging from 10 g to kilogram levels.

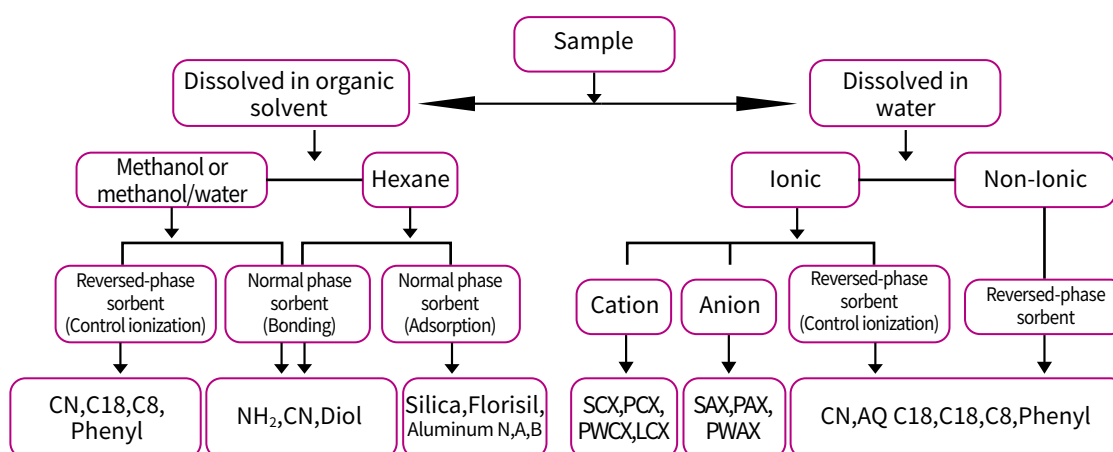


Selection Guide of Solid Phase Extraction Product

Categorized by Product Type

Selection of Cartridge Sorbent

First, select the appropriate sorbent based on the differences between the target compound and interferences, such as polarity, molecular weight, and pKa value, etc.

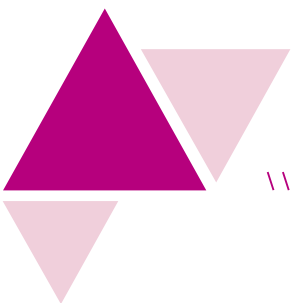


Specification Selection of Solid Phase Extraction Cartridge

For reversed-phase, normal-phase, and adsorption solid phase extraction cartridges, the mass of the extracted sample should not exceed 5% of the SPE cartridge sorbent. (Due to the differences between the target analyte and sample matrix, this value is for reference only.) For ion exchange solid phase extraction cartridges, the ion exchange capacity must be considered. The adsorption capacity of Cleanert SAX and SCX cartridges is approximately 0.2 meq/g. The table below shows the theoretical capacity and elution parameters of SPE cartridges:

Selection of SPE Cartridge Loading Capacity and Elution Volume

Specification	Maximum Sample Loading Volume	Volume	Minimum Elution Volume
50 mg - 100 mg	2.5 mg-5 mg	1 mL	100 µL-200 µL
100 mg - 200 mg	5 mg-10 mg	3 mL	200 µL-500 µL
200 mg - 1 g	10 mg-50 mg	6 mL	500 µL-6 mL
500 mg - 2 g	25 mg-100 mg	12 mL	3 mL-10 mL
2 g - 5 g	100 mg-250 mg	25 mL	10 mL-50 mL
5 g - 10 g	250 mg-500 mg	60 mL	20 mL-50 mL



Selection Table of Common Solid Phase Extraction Cartridge Brands

Functional Group	Agela	Waters	Agilent	Supelco	CNW
PS-DVB (Polystyrene-divinylbenzene)	Cleanert PS	/	Bond Elut ENV,LMS	ENVI-Chrom P	Poly-Sery PSD
NVP (Vinylpyrrolidone)	Cleanert PEP	Oasis HLB	Bond Elut Plexa	/	Poly-Sery HLB
PS-DVB-NVP/Sulfonic Acid Group	Cleanert PCX	Oasis MCX	Bond Elut Plexa PCX	/	Poly-Sery MCX
PS-DVB-NVP/Quaternary Ammonium Salt	Cleanert PAX	Oasis MAX	Bond Elut Plexa PAX	/	Poly-Sery MAX
PS-DVB-NVP/1,4- Diazacyclohexane	Cleanert PWAX	Oasis WAX	/	/	/
PS-DVB-NVP/Carboxyl Group	Cleanert PWCX	Oasis WCX	/	/	/
Si (Silica)	Cleanert Silica	Sep-Pak Silica	Bond Elut SI	DSC-Si,LC-Si	CNWBOND Si
C8	Cleanert C8	Sep-Pak C8	Bond Elut C8	DSC-8,ENVI-8, LC-8	CNWBOND C8
C18 (Non-Endcapped)	Cleanert C18-N	Sep-Pak C18	Bond Elut C18 OH	LC-18	CNWBOND LC-C18
C18 (Endcapped)	Cleanert C18	Sep-Pak C18	Bond Elut C18	ENVI-18,DSC-C18	CNWBOND HC-C18
Phenyl (Phenyl Group)	Cleanert Phenyl	/	Bond Elut PH	DSC-Ph,LC-Ph	CNWBOND PHE
CN (Cyano Group)	Cleanert CN	Sep-Pak CN	Bond Elut CN-U	DSC-CN,LC-CN	CNWBOND CN
Diol (Diol Group)	Cleanert Diol	Sep-Pak Diol	Bond Elut 2OH	DSC-Diol,LC-Diol	CNWBOND diol
NH ₂ (Amino Group)	Cleanert NH ₂	Sep-Pak Amino Propyl	Bond Elut NH ₂	DSC-NH ₂ ,LC-NH ₂	CNWBOND NH ₂
PSA (Ethylenediamine-N-propyl)	Cleanert PSA	/	Bond Elut PSA	PSA	CNWBOND PSA
COOH (Carboxyl group)	Cleanert COOH	/	Bond Elut CBA	LC-WCX	CNWBOND WCX
SAX (Strong Anion Exchange)	Cleanert SAX	Accell Plus QMA	Bond Elut SAX	DSC-SAX,LC-SAX	CNWBOND SAX
SCX (Strong Cation Exchange)	Cleanert SCX	Accell Plus CM	Bond Elut SCX	DSC-SCX,LC-SCX	CNWBOND SCX
PRS (Propanesulfonic acid)	Cleanert PRS	/	Bond Elut PRS	DSC-MCAX	CNWBOND PRS
Florisil	Cleanert Florisil	Sep-Pak Florisil	Bond Elut Florisil	ENVI-Florisil, LC-Florisil	CNWBOND Florisil
Diatomite	Cleanert SLE	/	Chem Elut SLE	Extrelut NT	/
Alumina (AL-A)	Cleanert Alumina A	Sep-Pak Alumina A	Bond Elut AL-A	LC-Alumina A	CNWBOND Alumina-A
Alumina (AL-N)	Cleanert Alumina N	Sep-Pak Alumina N	Bond Elut AL-N	LC-Alumina N	CNWBOND Alumina-N
Alumina (AL-B)	Cleanert Alumina B	Sep-Pak Alumina B	Bond Elut AL-B	LC-Alumina B	CNWBOND Alumina-B
Graphitized Carbon (GCB)	Cleanert PestiCarb	/	Bond Elut Carbon	ENVI-Carb	CNWBOND Carbon-GCB
GCB/NH ₂	Cleanert PestiCarb/NH ₂	/	Bond Elut Carbon/NH ₂	ENVI-Carb-II/NH ₂	CNWBOND GCB/NH ₂
GCB/PSA	Cleanert PestiCarb/PSA	/	/	ENVI-Carb-II/PSA	CNWBOND GCB/PSA



Product Series and Ordering Information

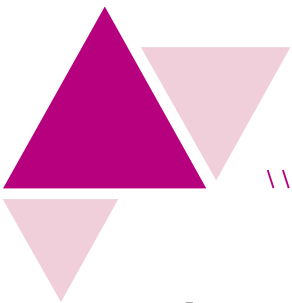
Cleanert[®] MAS-QuEChERS

Sample Preparation can be surprisingly simple!

How to perform trace analysis and sample preparation on increasingly complex sample matrices has become a major challenge in the industry. Traditional sample preparation techniques have evolved through several stages such as liquid-solid extraction, liquid-liquid extraction, and solid phase extraction. In 2003, drawing upon their extraction experience, chemists at the U.S. Department of Agriculture developed QuEChERS (quick, easy, cheap, effective, rugged, and safe), a method for effectively separating trace pesticide residues in various fruits and vegetables. In recent years, coupled with the high sensitivity and selectivity of liquid chromatography-mass spectrometry (LC-MS) and gas chromatography-mass spectrometry (GC-MS) instruments, QuEChERS technology has made significant progress. Currently, the most commonly used methods are AOAC 2007.01 and EN15662.

So...

What is Cleanert MAS-QuEChERS?



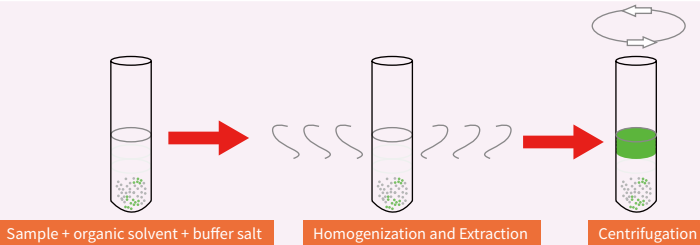
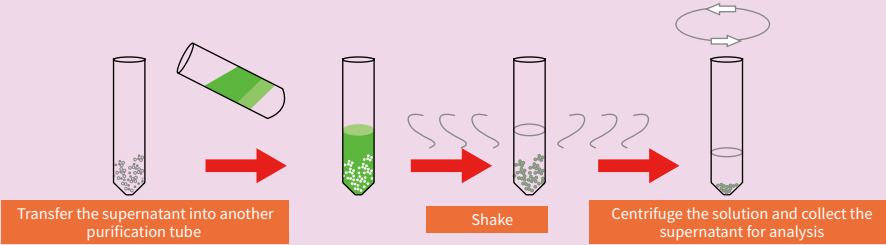
Cleanert[®] MAS-QuEChERS is...

The MAS-Q series products are a range of rapid sample preparation products developed based on QuEChERS technology. MAS stands for Multi-function Impurity Adsorption SPE, which means "multi-mechanism impurity adsorption extraction purification method". These products can be applied in various fields such as pesticide residue detection, veterinary drug residue detection, and food additive detection. A wide variety of sorbents can be used in these products, for example, Cleanert Pesticarb for removing pigments, Cleanert PSA and Cleanert PAX for removing acidic substances like organic acids, Cleanert PCX for removing alkaline interferents, Cleanert C18 for removing fats, and anhydrous magnesium sulfate for removing moisture. Additionally, the addition of certain buffering salts can aid in better extraction of drugs. A variety of combinations are possible to meet different sample preparation needs.

Method Advantages

1	High drug recovery rate: This method achieves a satisfactory recovery rate for most highly polar pesticides, making it suitable for multi-residue preliminary screening and detection.
2	Reduced solvent consumption and environmentally friendly: The container can be sealed immediately after adding the organic solvent, minimizing operator exposure.
3	Simple, efficient, and cost-effective
4	With fewer operational steps, the potential for human error impacting the method's accuracy is significantly reduced.

Method Operation Process

Sample Pre-treatment	To ensure optimal sample homogeneity, solid samples like fruits and vegetables require chopping and homogenization prior to use. Typically, 10-15 g of the sample is homogenized using a high-speed tissue homogenizer at a speed of 11,000 r/min-24000 r/min).
Step 1: Sample Extraction	Weigh an appropriate amount of the homogenized sample into an MAS-Q extraction tube. Add an appropriate amount of organic solvent and mix thoroughly. Tear open the sample extraction package, transfer the extraction salt into a centrifuge tube, add four homogeneous protons and homogenize or sonicate the mixture. Centrifuge the mixture and collect the supernatant for purification. 
Step 2: Purification	Select the appropriate MAS-Q purification tube based on the sample type. Add an appropriate amount of the extract to the purification tube and shake vigorously to ensure thorough mixing and contact between the extract and the sorbent. Centrifuge the mixture and collect the supernatant for concentration or direct injection for detection. After initial purification with a purification tube, the supernatant from the complex matrix can be further purified using other purification tubes to achieve the desired purification effect. 

Precautions

1	Adding a sample to the MAS purification tube containing anhydrous magnesium sulfate may generate heat and gas. It is recommended to shake the tube for a period, then intermittently vent the centrifuge tube to release any gas. Afterward, continue shaking and proceed with the remaining steps.
2	When adding a sample with high water content to a MAS purification tube containing anhydrous magnesium sulfate, please add the extraction solvent first and then the sample during the operation to prevent clumping between the sample and the anhydrous magnesium sulfate.
3	Please ensure the product is stored in a sealed environment. If the product is not fully used after opening, seal it in a storage bag or store it in a desiccator or a dry, ventilated area.
4	Existing problems with the original QuEChERS method: In acidic matrices (e.g., oranges), the recovery rate of relatively alkaline pesticides is low. Degradation of alkali-sensitive pesticides can even occur in neutral matrices. Adding a mixed solution of HAc and NaAc to the extract during the analysis of acidic matrices (e.g., oranges) maintains the pH of the solution system between 4 and 5, thus addressing the issue of reduced recovery rates for alkaline pesticides.

Upgraded Packaging of Cleanert MAS-QuEChERS Products

(1) MAS-QuEChERS family expands with new product: upgraded extraction salt packaging. The extraction salts now feature a slimmer packaging design, allowing lab personnel to transfer them effortlessly without spillage during pouring.

(2) The MAS-QuEChERS centrifuge tubes are now upgraded with premium medical-grade PP material that does not introduce any interferences during experiments. The tube walls are thickened to prevent cracking even when high-speed centrifugation is performed with homogenization beads. The tube caps are equipped with special sealing grooves, effectively preventing leakage and maintaining seal integrity even at high-speed centrifugation of 8000 rpm.

(3) Glass homogenization beads can be used once and eliminate the need for laboriously recovering homogenization beads from sample residues. It is recommended to add 4 beads per sample, and there are also pre-packaged extraction tubes with homogenization beads available for selection.



Extraction salt package



Glass homogenization beads



QuEChERS purification tube

Selection Guide of Cleanert MAS-QuEChERS Product

First step: extraction

Second step: purification

GB 23200.113-2018
National Food Safety Standard-Determination of 208 Pesticides and Metabolites Residues in Foods of Plant Origin-Gas Chromatography-Tandem Mass Spectrometry Method

Vegetables,
fruits, and
edible fungi

4 g MgSO₄, 1 g NaCl,
1 g sodium citrate,
0.5 g disodium hydrogen citrate
Part No.: MS-NMS5050

900 mg MgSO₄, 150 mg PSA
Part No.: MS-PA1011
Dark sample
885 mg MgSO₄, 150 mg PSA, 15 mg PestiCarb
Part No.: MS-PP1513

Cereals, oils,
and nuts

6g MgSO₄, 1.5g NaAC
Part No.: MS-MG5052

1200 mg MgSO₄, 400 mg PSA, 400 mg C18
Part No.: MS-9PA1011

Tea and
spices

6 g MgSO₄, 1.5 g NaAC
Part No.: MS-MG5052

1200 mg MgSO₄, 400 mg PSA, 400 mg C18,
200 mg PestiCarb
Part No.: MS-9PP0281

2020 Edition of the Chinese Pharmacopoeia
Pesticide Residue Detection in Chinese Herbal Medicines

QuEChERS
method 1

6 g MgSO₄(Anhydrous),
1.5 g NaAc(Anhydrous)
Part No.: MS-MG5052

900 mg MgSO₄(Anhydrous), 300 mg C18,
300 mg PSA, 300 mg Silica, 90 mg PC
Part No.: MS-9PP0268

Solid-phase
extraction
method 1

—

1200 mg MgSO₄(Anhydrous), 300 mg PSA,
100 mg C18
Part No.: MS-9PA1233

Determination Method for Pesticide Residues
(General Chapter 2341, Volume IV, ChP, 2025 Edition)

QuEChERS
method 1

6 g MgSO₄(Anhydrous),
1.5 g NaAc(Anhydrous)
Part No.: MS-MG5052-1

900 mg MgSO₄(Anhydrous), 300 mg C18,
300 mg PSA, 300 mg Silica, 90 mg PC
Part No.: MS-9PP0268

Solid-phase
extraction method 1

—

1200 mg MgSO₄(Anhydrous), 300 mg PSA,
100 mg C18
Part No.: MS-9PA1233

Wolfberry, lily,
Ophiopogon
japonicus method 2

6 g MgSO₄(Anhydrous),
1.5 g NaAc(Anhydrous)
Part No.: MS-MG5052-1

—

Notoginseng, Zhejiang
Fritillaria, Sichuan
Fritillaria, Hubei Fritillaria,
Yifritillaria, Pingfritillaria,
Atractylodes
macrocephala method 2

6 g MgSO₄(Anhydrous),
1.5 g NaAc(Anhydrous)
Part No.: MS-MG5052-1

900 mg MgSO₄(Anhydrous), 300 mg PSA,
300 mg C18, 100 mg Silica, 45 mg PC
Part No.: MS-9PP0292

NY/T 1380-2007
Determination of 51 Pesticide Residues in Vegetables and Fruits by Gas Chromatography-Mass Spectrometry

Removal of Polar
Organic Acids, Sugars,
and Lipids from Simple
Matrix Fruits and
Vegetables

6 g MgSO₄(Anhydrous);
1.5 g NaAc
Part No.: MS-MG5052

15 mL centrifuge tube;
recommended sample volume: 2 mL
100 mg PSA, 100 mg C18, 300 mg MgSO₄
Part No.: MS-9PA1010

First step: extraction

Second step: purification

AOAC 2007.01 Method

6 g MgSO₄(Anhydrous);
1.5 g NaAc
Part No.: MS-MG5052

Simple Matrix
Vegetables and
Fruits

2 mL centrifuge tube; recommended sample volume: 1 mL
50 mg PSA, 150 mg MgSO₄
Part No.: MS-PA0250

15 mL centrifuge tube; recommended sample volume: 8 mL
400 mg PSA, 1200 mg MgSO₄
Part No.: MS-PA1012

Fruits and
vegetables
containing starch
and fat

2 mL centrifuge tube; recommended sample volume: 1 mL
50 mg PSA, 50 mg C18, 150 mg MgSO₄
Part No.: MS-9PA0203

15 mL centrifuge tube; recommended sample volume: 8 mL
400 mg PSA, 400 mg C18, 1200 mg MgSO₄
Part No.: MS-9PA1011

Fruits and
vegetables rich
in pigments

2 mL centrifuge tube; recommended sample volume: 1 mL
50 mg PSA, 50 mg PC, 150 mg MgSO₄
Part No.: MS-PP0250

15 mL centrifuge tube; recommended sample volume: 8 mL
400 mg PSA, 400 mg PC, 1200 mg MgSO₄
Part No.: MS-PP1550

EN 15662 Method

4 g MgSO₄(Anhydrous); NaCl 1 g;
0.5g disodium hydrogen citrate;
1g sodium citrate;
Part No.: MS-NMS5050

Simple Matrix
Vegetables and
Fruits

2 mL centrifuge tube; recommended sample volume: 1 mL
25 mg PSA, 0.15 g MgSO₄(Anhydrous)
Part No.: MS-PA0251

15 mL centrifuge tube; recommended sample volume: 6 mL
150 mg PSA, 0.9 g MgSO₄(Anhydrous)
Part No.: MS-PA1011

Fruits and
vegetables
containing starch
and fat

2 mL centrifuge tube; recommended sample volume: 1 mL
25 mg PSA, 25 mg C18, 0.15 g MgSO₄(Anhydrous)
Part No.: MS-9PA0204

15 mL centrifuge tube; recommended sample volume: 6 mL
150 mg PSA, 150 mg C18, 0.9 g MgSO₄(Anhydrous)
Part No.: MS-9PA1210

Fruits and
vegetables rich
in pigments

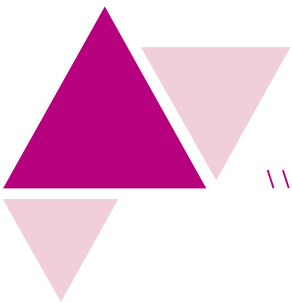
2 mL centrifuge tube; recommended sample volume: 1 mL
25 mg PSA, 2.5 mg PC, 0.15 g MgSO₄(Anhydrous)
Part No.: MS-PP0251

15 mL centrifuge tube; recommended sample volume: 6 mL
150 mg PSA, 15 mg PC, 0.9 g MgSO₄(Anhydrous)
Part No.: MS-PP1511

General QuEChERS Method

6 g MgSO₄(Anhydrous); 1.5 g NaCl
Part No.: MS-MG5051

4 g MgSO₄(Anhydrous); 1 g NaCl
Part No.: MS-MG5055



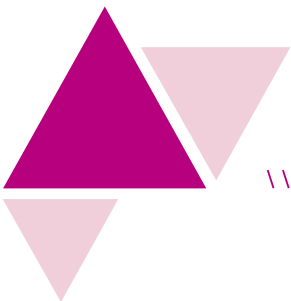
Ordering Information of Cleanert MAS-QuEChERS

Ordering Information of Cleanert MAS-QuEChERS Extraction Tube

Product Ingredients	Packaging	Aluminum foil bag packaging (excluding centrifuge tubes and homogenization beads)	Aluminum foil bag packaging, 50/PK (including 50 mL centrifuge tubes, excluding homogenization beads)	Aluminum foil bag packaging, 50/PK (including 50 mL centrifuge tubes and homogenization beads)	Reference Method
6 g MgSO ₄ (Anhydrous) 1.5 g NaAc (Anhydrous)		MS-MG5052-1	MS-MG5052	MS-MG5052-H	QuEChERS extraction tube with buffer salt, AOAC 2007.01 method; also applicable to the agricultural industry standard NYT 1380-2007.
6 g MgSO ₄ (Anhydrous) 1.5 g NaAc		MS-MG5050-1	MS-MG5050	—	QuEChERS extraction tube with buffer salt, AOAC 2007.01 method; also applicable to the agricultural industry standard NYT 1380-2007.
1 g NaCl 4 g MgSO ₄ (Anhydrous) 0.5 g Disodium Hydrogen Citrate, 1 g Sodium Citrate		MS-NMS5050-1	MS-NMS5050	MS-NMS5050-H	QuEChERS extraction tube with buffer salt, EN 15662 method, for 10 g samples.
4 g MgSO ₄ (Anhydrous) 1 g NaAc (Anhydrous)		MS-MG5057-1	MS-MG5057	MS-MG5057-H	QuEChERS extraction tube with buffer salt
4 g Na ₂ SO ₄ (Anhydrous) 1 g NaCl		MS-MG5054-1	—	—	Initial QuEChERS method extraction tube for 15 g samples.
4 g MgSO ₄ (Anhydrous) 1 g NaCl		MS-MG5055-1	MS-MG5055	MS-MG5055-H	Initial QuEChERS method extraction tube for 15 g samples.
6 g MgSO ₄ (Anhydrous) 1 g NaCl		MS-MG5053-1	MS-MG5053	—	Initial QuEChERS method extraction tube for 15 g samples.
6 g MgSO ₄ (Anhydrous) 1.5 g NaCl		MS-MG5051-1	MS-MG5051	—	Initial QuEChERS method extraction tube for 15 g samples.

Ordering Information of Cleanert MAS-QuEChERS Purification Tube

Applicable Matrices	Product Ingredients	Reference Method	Centrifuge Tube Specifications	Part Number
Simple matrix vegetables and fruits, such as apples, cabbages, and cucumbers. 	50 mg PSA, 150 mg MgSO ₄ (Anhydrous)	AOAC 2007.01	2 mL Centrifuge Tubes 100/PK	MS-PA0250
	400 mg PSA, 1200 mg MgSO ₄ (Anhydrous)	AOAC 2007.01	15 mL Centrifuge Tubes 50/PK	MS-PA1012
	25 mg PSA, 150 mg MgSO ₄ (Anhydrous)	EN 15662	2 mL Centrifuge Tubes 100/PK	MS-PA0251
	150 mg PSA, 900 mg MgSO ₄ (Anhydrous)	EN 15662	15 mL Centrifuge Tubes 50/PK	MS-PA1011
Vegetables and fruits containing lipids and proteins, such as potatoes, corn, and avocados. 	50 mg C18, 50 mg PSA, 150 mg MgSO ₄ (Anhydrous)	AOAC 2007.01	2 mL Centrifuge Tubes 100/PK	MS-9PA0203
	400 mg C18, 400 mg PSA, 1200 mg MgSO ₄ (Anhydrous)	AOAC 2007.01	15 mL Centrifuge Tubes 50/PK	MS-9PA1011
	25 mg C18, 25 mg PSA, 150 mg MgSO ₄ (Anhydrous)	EN 15662	2 mL Centrifuge Tubes 100/PK	MS-9PA0204
	150 mg C18, 150 mg PSA, 900 mg MgSO ₄ (Anhydrous)	EN 15662	15 mL Centrifuge Tubes 50/PK	MS-9PA1210
	100 mg PSA, 100 mg C18, 300 mg MgSO ₄ (Anhydrous)	NYT 1380-2007	15 mL Centrifuge Tubes 50/PK	MS-9PA1010
Vegetables and fruits with high pigment content, such as carrots, spinach, and Indian lettuce. 	25 mg PSA, 2.5 mg PestiCarb, 150 mg MgSO ₄ (Anhydrous)	EN 15662	2 mL Centrifuge Tubes 100/PK	MS-PP0251
	150 mg PSA, 15 mg PestiCarb, 900 mg MgSO ₄ (Anhydrous)	EN 15662	15 mL Centrifuge Tubes 50/PK	MS-PP1511
	25 mg PSA, 7.5 mg PestiCarb, 150 mg MgSO ₄ (Anhydrous)	EN 15662	2 mL Centrifuge Tubes 100/PK	MS-PP0252
	50 mg PSA, 50 mg PestiCarb, 150 mg MgSO ₄ (Anhydrous)	AOAC 2007.01	2 mL Centrifuge Tubes 100/PK	MS-PP0250
	150 mg PSA, 50 mg PestiCarb, 900 mg MgSO ₄ (Anhydrous)	EN 15662	15 mL Centrifuge Tubes 50/PK	MS-PP1510
	400 mg PSA, 400 mg PestiCarb, 1200 mg MgSO ₄ (Anhydrous)	AOAC 2007.01	15 mL Centrifuge Tubes 50/PK	MS-PP1550



Applicable Matrices	Product Ingredients	Reference Method	Centrifuge Tube Specifications	Part Number
Complex matrix samples, such as tea and Chinese chives. 	50 mg PSA, 50 mg C18, 50 mg PestiCarb, 150 mg MgSO ₄ (Anhydrous)	AOAC 2007.01	2 mL Centrifuge Tubes 100/PK	MS-9PP0250
	400 mg PSA, 400 mg C18, 400 mg PestiCarb, 1200 mg MgSO ₄ (Anhydrous)	AOAC 2007.01	15 mL Centrifuge Tubes 50/PK	MS-9PP0253
	150 mg PSA, 150 mg PestiCarb, 150 mg C18, 900 mg MgSO ₄ (Anhydrous)		15 mL Centrifuge Tubes 50/PK	MS-9PP0252
Consumables for empty centrifuge tubes	50 mL PP screw-cap threaded centrifuge tube		50 mL Centrifuge Tubes 50/PK	LXG0050-50
	15 mL PP screw-cap threaded centrifuge tube		15 mL Centrifuge Tubes 50/PK	LXG0015-50
	2 mL PP screw-cap threaded centrifuge tube		2 mL Centrifuge Tubes 100/PK	LXG0002-100
Glass homogenization beads	Glass homogenization beads compatible with 50 mL centrifuge tubes		50/PK	HG01
	Glass homogenization beads compatible with 50 mL centrifuge tubes		500/PK	HG500

Milk Sample Analysis

Applicable Matrices	Product Ingredients	Reference Method	Centrifuge Tube Specifications	Part Number
Samples with high protein content, such as cow's milk 	Suitable for the sample preparation of melamine samples in dairy products	Purification materials using ion exchange and reverse phase mixing mechanism	50 mL Centrifuge Tubes 50/PK	MS-SPM5001
	Suitable for the sample preparation of dicyanodiamide samples in dairy products		15 mL Centrifuge Tubes 50/PK	MS-SQA02

96-Well Plates for Biological Matrix Sample Preparation



Cleanert Bio-scavenger Protein and Phospholipid Removal Plate



Why Are Laboratories Starting to Use Protein and Phospholipid Removal Plates?

Biological samples contain a large number of phospholipids (amphiphilic molecules). Due to the limited purification capability of protein precipitation, this treatment method is ineffective in removing phospholipids. Once they enter the liquid chromatography-mass spectrometry (LC-MS) system, phospholipids will accumulate on the chromatographic column and the ion source. This characteristic significantly affects the lifespan of the chromatographic column and the signal intensity of compounds (usually manifested as a decrease), leading to severe matrix effects. More seriously, as the analysis progresses, the elution time of the accumulated phospholipids becomes significantly unpredictable. This means that although we have tried our best to avoid the co-elution of phospholipids during method development, there is still a risk of failure in actual analysis batches.

Features

- Simple sample preparation process
- Products with 95% phospholipid removal rate
- Stable batch reproducibility
- Extended chromatographic column lifespan
- Significantly reduced sample retest rate

We have a simple sample preparation process without distinguishing the acidity and alkalinity of the compound.



Four times the volume of acetonitrile or acidified acetonitrile

Sample loading: Plasma, serum 50-200 μ L

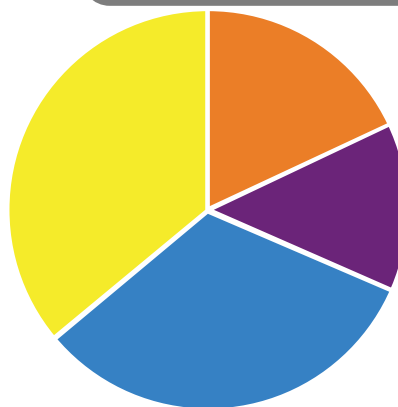
Mixing: Repeated pipetting or vortex mixing thoroughly

Collection: Positive pressure or negative pressure

Detection: LC-MS/MS analysis

With the Cleanert Bio-scavenger, the whole process takes only 15 minutes to get a clean sample.

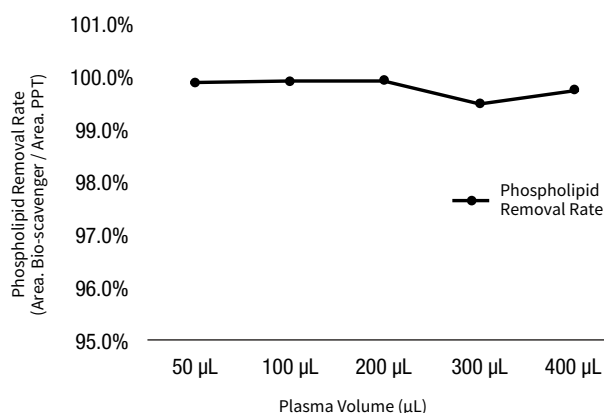
(Note that the processing time for SLE and SPE may vary depending on factors such as nitrogen purging time).



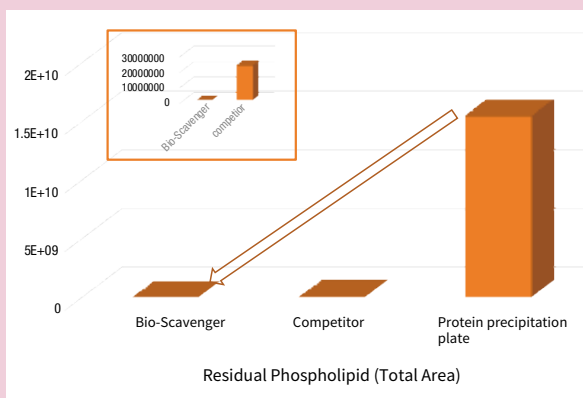
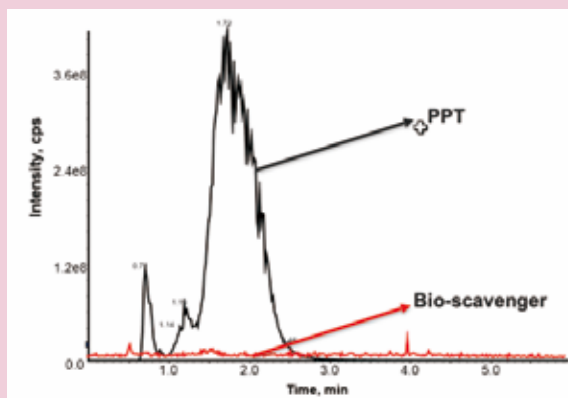
- PPT
- Bio-scavenger
- SLE
- SPE

Cleanert Bio-scavenger is a product capable of removing up to 95% of phospholipids.

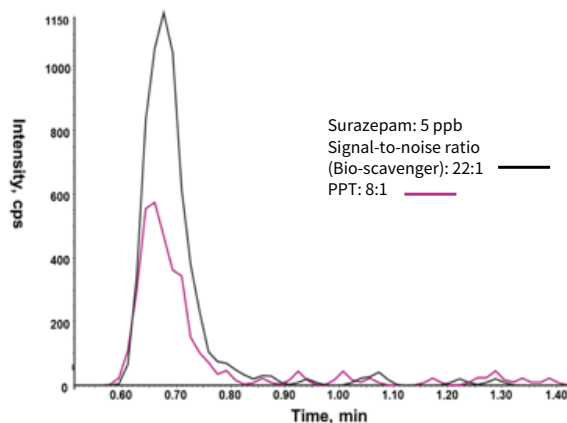
We compared the phospholipid removal efficiency of Cleanert Bio-scavenger across different sample loading volumes ranging from 50-400 μL (using 184/184 channel detection). The results demonstrated a consistently high phospholipid removal rate throughout the tested range.

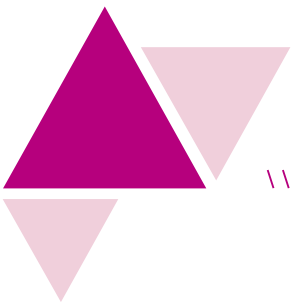


This advantage becomes even more apparent when compared to protein precipitation:

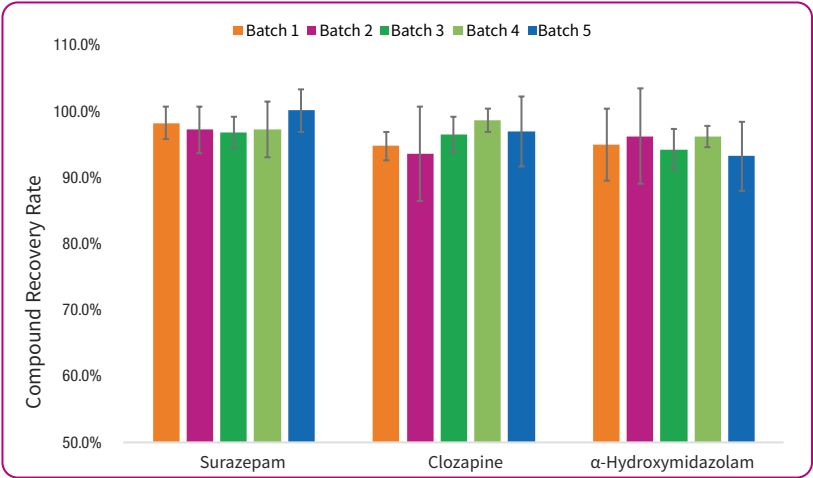


Now let's take a look at the performance of Cleanert Bio-scavenger in actual analysis.



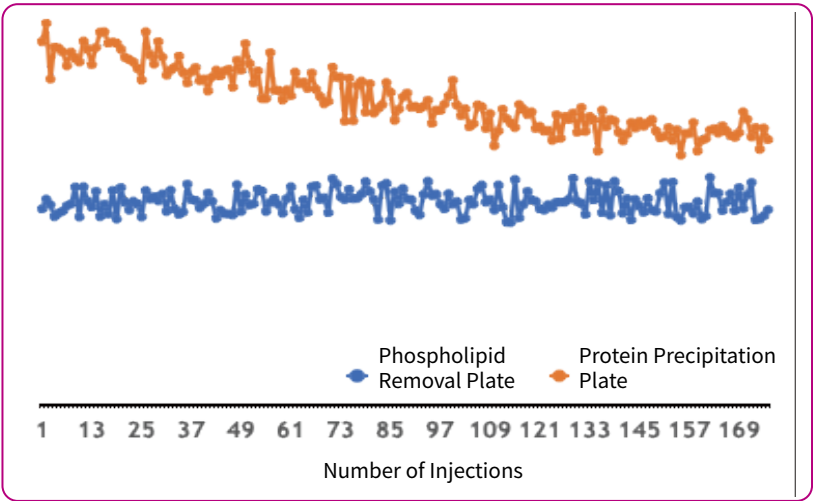


We have a simple sample preparation process without distinguishing the acidity and alkalinity of the compound.



We tested the recovery data for three typical compounds across five batches. The data demonstrated no significant difference in compound recovery between batches, with an RSD deviation of less than 10%.

During continuous injection, samples treated with Cleanert Bio-scavenger exhibited good stability. This largely prevents the issue where QC results appear acceptable (with consistent Ratio values) in actual analysis batches, while the internal standard and analyte response exhibit high RSD.



As shown in the left figure, during the continuous injection analysis of amlodipine, the sample compound response of protein precipitation fluctuated significantly, and the overall signal showed a continuous decline. When the analysis reached 80 injections, its RSD exceeded the standard limit, indicating the analysis batch had failed.

Ordering Information

Product Name	Type	Unit	Part Number
Cleanert Bio-scavenger Phospholipid Removal Plate	96-well plate	30 mg/2 mL/well (2/Pk)	Bio-0302W
Cleanert Bio-scavenger Phospholipid Removal Cartridge	SPE Cartridge	30 mg/1 mL (100/Pk)	Bio-0301

Note: For more product information, please contact your local sales representative.

Cleanert PPT Protein Precipitation Plate



Description

Cleanert PPT (Protein Precipitation Plate) protein precipitation products utilize a high-purity frit plate specifically designed for protein precipitation. This effectively blocks commonly used protein precipitation solvents such as acetonitrile, preventing any seepage. Compared to traditional PPT methods, it eliminates the need for additional time-consuming sample pretreatment steps, enabling automated, high-throughput processing of biological samples like plasma and serum.

Features

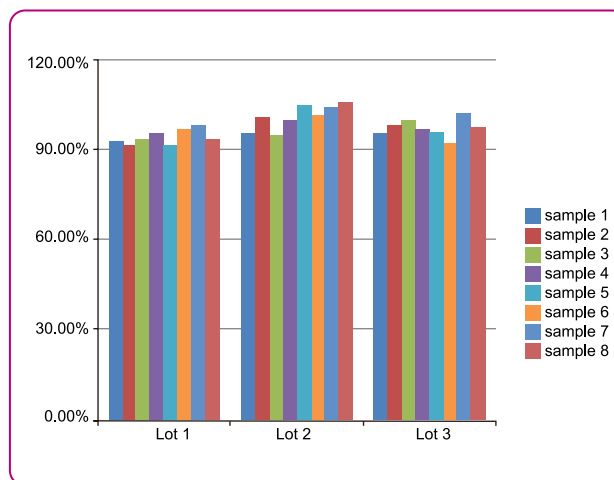
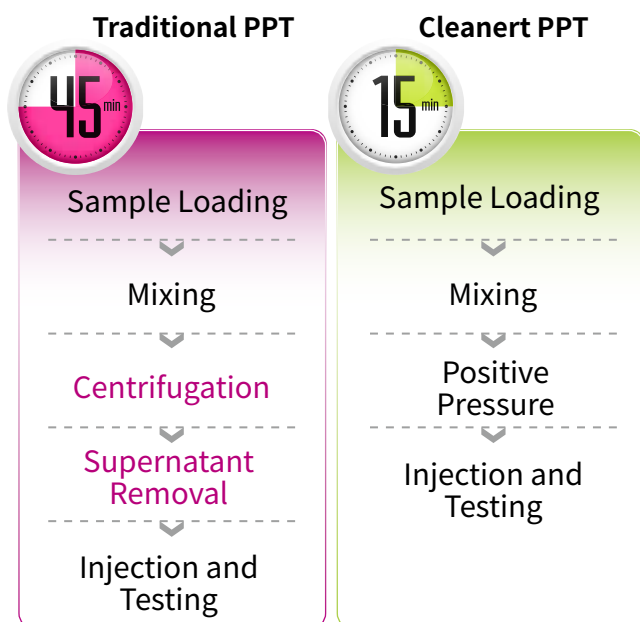
- Simple and fast operation with in-well precipitation.
- No seepage, preventing premature sample outflow and incomplete protein precipitation
- Effectively removes protein interference and improves analytical sensitivity.

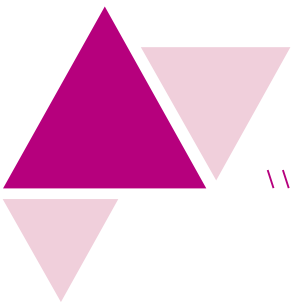
Processing Time Comparison

Cleanert PPT requires significantly less processing time than traditional PPT methods, increasing laboratory sample throughput and improving work efficiency.

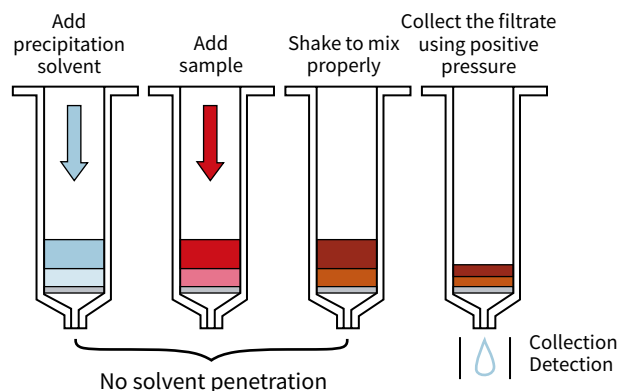
Reproducibility Between Batches

Using pregabalin as the target analyte, the recovery rate and inter-well/inter-batch variability of the Cleanert PPT plate were evaluated. The results demonstrated that the Cleanert PPT plate exhibited excellent recovery rates and high parallelism across wells and batches.





Recommended Steps



- Place the Cleanert PPT and the collection plate together.
- Add a volume of precipitation solvent at least three times greater than the sample volume.
- Add the desired volume of the biological sample.
- Thoroughly mix the sample by pipetting or vortexing, then let it stand for 5 minutes.
- Analyze the filtrate collected using positive pressure.

Ordering Information

Product Name	Type	Unit	Part Number
Cleanert PPT Protein Precipitation Plate	96-well plate	2 mL/well (2/Pk)	96CD2025-Q
		2 mL/well (10/Pk)	96CD2025-Q-10
Cleanert PPT Microwell Protein Precipitation Plate	96 micro-well plate	1 mL/well (2/Pk)	96CD1025-M
		1 mL/well (10/Pk)	96CD1025-M-10
		1 mL/well (80/Pk)	96CD1025-M-L
Cleanert PPT Protein Precipitation Plate (Fixed Plate)	96-well plate	1 mL/well (2/Pk)	96CD1025-Z
		1 mL/well (10/Pk)	96CD1025-Z-10
Cleanert Protein Precipitation Tube	SPE Cartridge	1 mL (100/Pk)	96CD01

Note: For more product information, please contact your local sales representative.

Cleanert 96-Well Filter Plate

Description

The 96-well filter plate enables automated, high-throughput processing of biological samples (e.g., plasma, serum). Frits with various materials and pore sizes accommodate diverse sample filtration needs, while different specifications cater to the pretreatment requirements of trace samples.

Ordering Information

Product Name	Type	Unit	Part Number
PP Filter Plate	96-well plate	0.45 µm/0.3 mL	96GL0324-1
PVDF Filter Plate	96-well plate	0.22 µm/2 mL	96GL0322
PP Filter Plate	96-well plate	0.22 µm/2 mL	96GL2022
PTFE Filter Plate	96-well plate	0.22 µm/2 mL	96GL2022-PT
PTFE Filter Plate	96-well plate	0.22 µm/0.3 mL	96GL0322-C-YS

Cleanert® SLE Supported Liquid Extraction Product

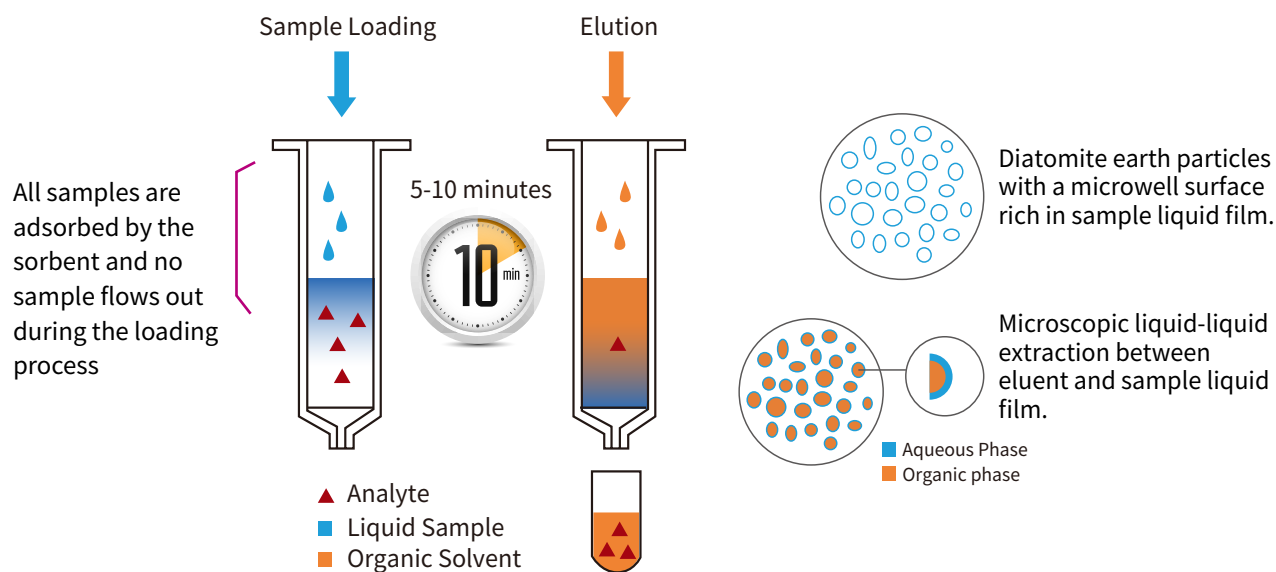
Description

Cleanert SLE solid-phase supported liquid-liquid extraction product utilizes specially processed diatomite earth, which features a large specific surface area and low surface activity, providing an ideal support surface for liquid-liquid distribution. It can replace most traditional liquid-liquid extraction methods. This method can be applied in various fields such as pharmaceutical analysis, drug metabolism analysis, biochemical analysis, textiles, food, and the environmental related analysis.

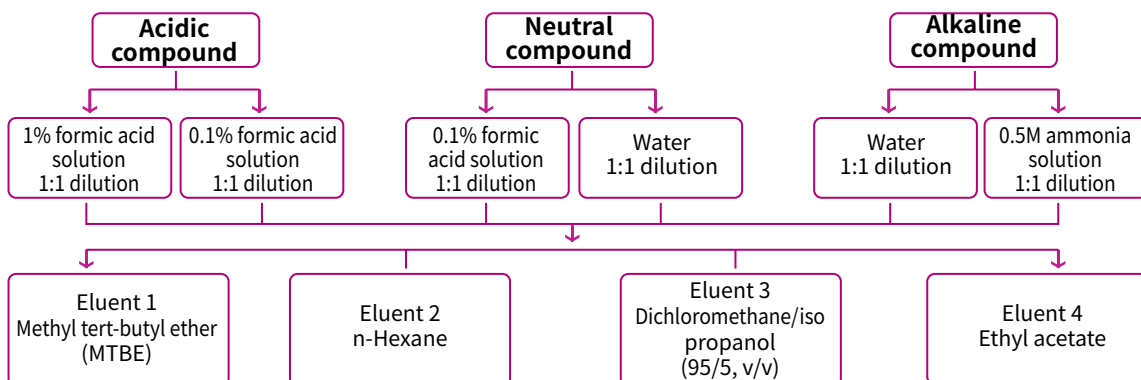
Compared with traditional liquid-liquid extraction, this method offers higher extraction efficiency and recovery rates. It accommodates biological fluid extraction volumes as low as 100 µL, prevents emulsification, and reduces extraction time by more than 50%.



Operation Process



Recommended Method Development Process



Excellent Phospholipid Removal Performance

LLE Phospholipid Removal Comparison SLE

A 100 μ L plasma sample was diluted with an equal volume of buffer, and 1 mL of ethyl acetate was added.

The mixture was vortexed for 5 minutes and centrifuged at 4000 rpm for 10 minutes.

The organic phase was collected and dried under nitrogen at 45° C.

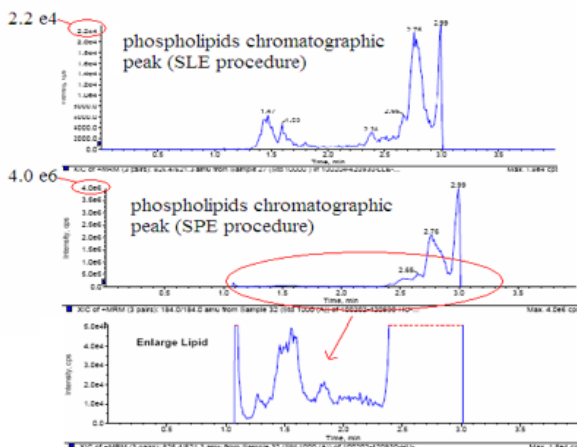
The residue was reconstituted with 200 μ L of methanol and analyzed.

A 100 μ L plasma sample was diluted with an equal volume of buffer and loaded onto a 96-well plate (300 μ L/well).

After standing for 20 minutes, each well was eluted with 1.5 mL of ethyl acetate under gravity, and the effluent was collected.

The collected solution was dried under nitrogen at 45° C.

The residue was reconstituted with 200 μ L of methanol and analyzed.



Precautions:

- The recommended ratio of sample loading volume to diatomite sorbent is 1:1.
- High viscosity samples should be diluted with buffer before loading.
- The recommended ratio of eluent to sample loading volume is 3:1. Multiple small elutions are more effective.

Application No.: CTSLE01

Comparison of SLE and LLE

SLE

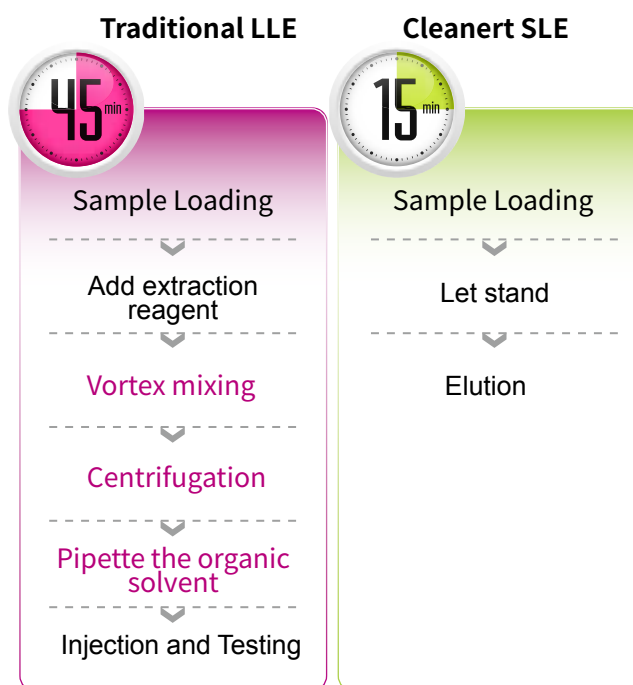
- › Reduced organic solvent usage
- › Shortened extraction process
- › No solution transfer required
- › No shaking required
- › Emulsion-free
- › Relatively simple operation
- › Easy to automate.

LLE

- › More organic solvent usage
- › Long extraction process
- › Organic solvent transfer required
- › Mechanical shaking required
- › Prone to emulsification problems
- › More complex operation
- › Difficult to automate

Processing Time Comparison

Cleanert SLE processes samples significantly faster than the traditional LLE method. It eliminates the need for supernatant pipetting, simplifying experimental operations and improving laboratory sample throughput.

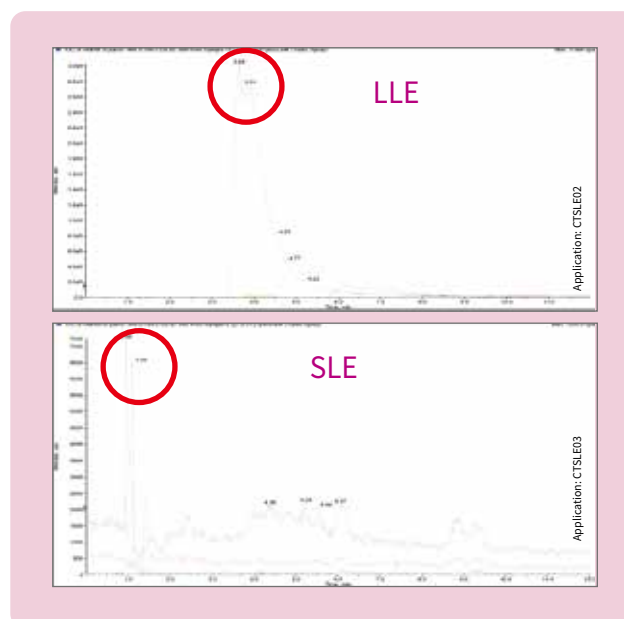


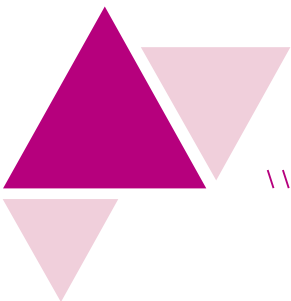
Purification Effect Comparison

Phospholipids are a major source of matrix effects. A comparison between Cleanert SLE and traditional LLE in removing phospholipid interference showed that Cleanert SLE demonstrated superior phospholipid removal effect.

Conclusion:

After purification with the SLE method, the phospholipid peak area was approximately 100 times lower than that obtained with the LLE method.





Ordering Information

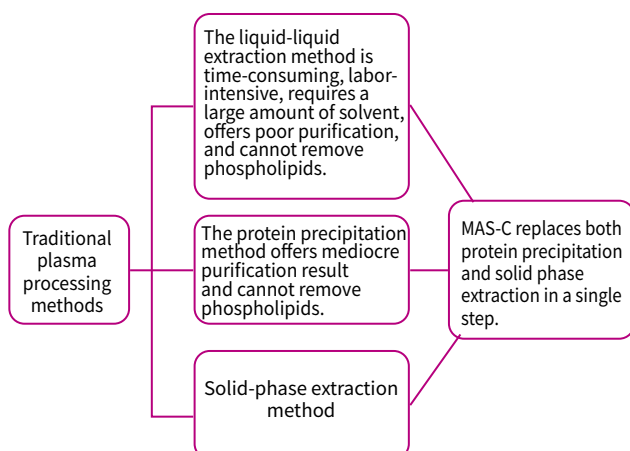
Product Name	Type	Maximum Sample Loading Volume	Unit	Neutral Surface	Basic Surface
				Part Number	Part Number
Cleanert SLE Diatomite Earth	SPE Cartridge	200 µL	3 mL (50/Pk)	-	HC2003Q-9
		500 µL	3 mL (50/Pk)	HC5003Q-7	HC5003Q-9
		500 µL	6 mL (30/Pk)	-	HC5006Q-9
		1 mL	6 mL (30/Pk)	HC0006Q-7	HC0006Q-9
		2 mL	12 mL (20/Pk)	HC200012Q-7	HC200012Q-9
		2 mL	60 mL (10/Pk)	-	HC200045-9
		3 mL	12 mL (20/Pk)	-	HC300012-9
		4 mL	25 mL (15/Pk)	HC400025Q-7	HC400025Q-9
		5 mL	25 mL (15/Pk)	-	HC500025Q-9
		10 mL	60 mL (10/Pk)	-	HC1000060-9
		20 mL	60 mL (10/Pk)	HC2000060-7	HC2000060-9
Cleanert SLE Diatomite Earth	96-well plate	200 µL	2 mL/well (2/Pk)	-	HC2002SQ-9W
		300 µL	2 mL/well (2/Pk)	HC3002-7W	HC3002SQ-9W
		400 µL	2 mL/well (2/Pk)	-	HC4002SQ-9W
		400 µL	3 mL/well (1/Pk)	-	HC4003SQ-9DW
		500 µL	3 mL/well (1/Pk)	HC5003Q-7DW	HC5003SQ-9DW
		600 µL	3 mL/well (1/Pk)	-	HC6003SQ-9DW
Cleanert SLE Sorbent	Sorbent	-	100 g/bottle	HC0100-7	HC0100-9
		-	500 g/bottle	HC0500-7	HC0500-9
		-	1 kg/bottle	HC1001000-7	HC1001000-9
		-	18 kg/barrel	HC018-7	HC018-9

Note: For more product information, please contact your local sales representative.

Cleanert[®] MAS-C

Description

MAS (Multi-function Impurity Adsorption SPE), also known as the “Multi-mechanism impurity adsorption and extraction purification method”, primarily utilizes multifunctional composite adsorbent materials to remove major endogenous interfering substances from biological samples through mechanisms such as ion exchange, reverse phase, and hydrogen bonding, while retaining the target drug in the sample solution, thereby achieving the purposes of purification and enrichment.

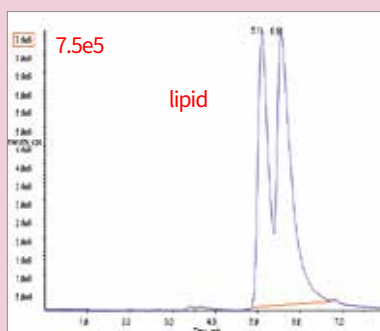


Features

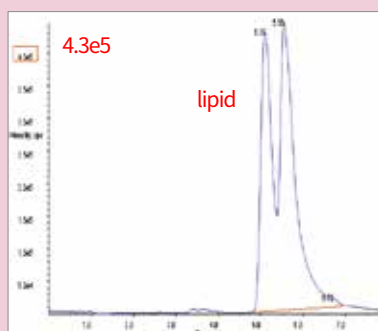
A hydrophobic frit can block denatured proteins in plasma, which is predominantly water-based, while organic solvents such as acetonitrile can easily pass through. The sorbent adsorbs impurities without adsorbing the target drug. Compatible with automated extraction instruments, this method improves experimental efficiency, simplifies operation, and provides a rapid, high-throughput pretreatment method.

The MAS-C 96-well plate series is particularly suitable for addressing the pretreatment challenges of highly polar substances that cannot be resolved by liquid-liquid extraction or solid-phase extraction methods. It also effectively removes phospholipids (the main interfering substance in biological samples that reduces the sensitivity of liquid chromatography-mass spectrometry detection), resulting in better parallelism of experimental results and improving the stability and reliability of the method.

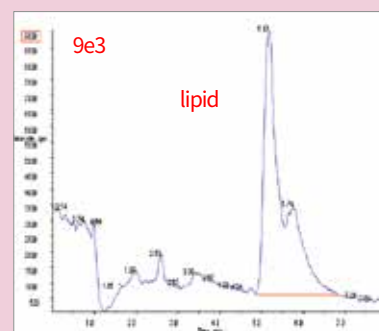
MAS-C products offer significant advantages in removing phospholipid matrix interference



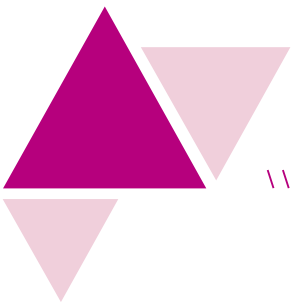
Response value: 7.5×10^5 CPS
PPT



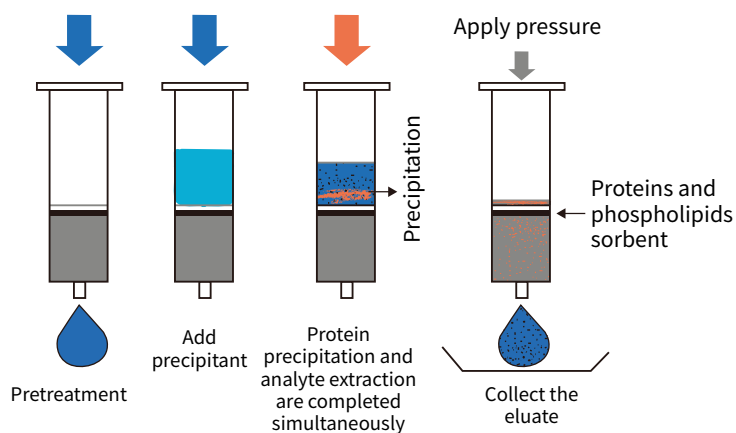
Response value: 4.3×10^5 CPS
SPE
m/z: 496/184



Response value: 9×10^3 CPS
MAS



Operation Process



Activate by adding acetonitrile.

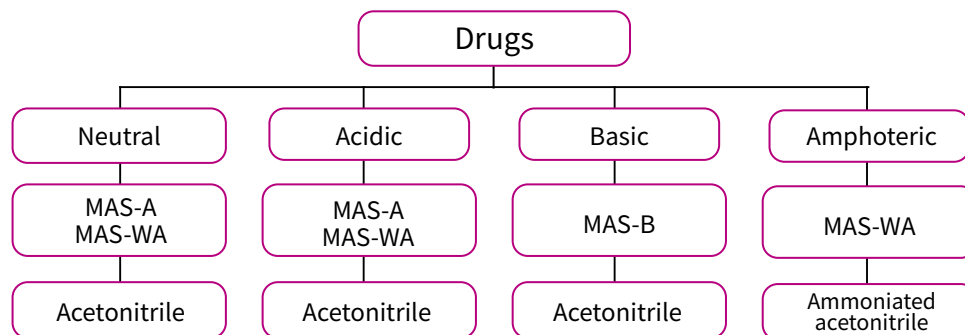
Add the precipitation reagent, preferably in a volume greater than 3 times that of the sample.

Add 10–100 μL of plasma or other samples.

Collect the solution with positive pressure.

Mix well with a pipette or vortex shaker and leave for 5 min.

MAS-C Product Selection Diagram



Ordering Information

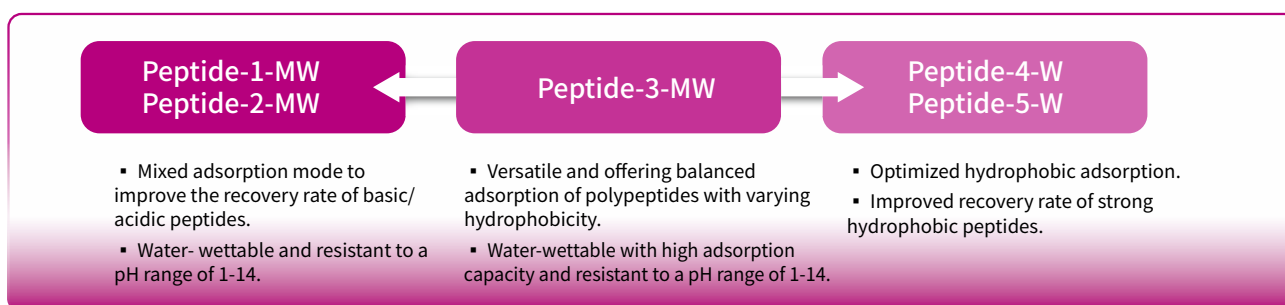
Product Name	Type	Unit	Part Number
Cleanert MAS-B	96-well plate	30 mg/2 mL/well (2/pk)	MS-B-0302W
Cleanert MAS-WA	96-well plate	30 mg/2 mL/well (2/pk)	MS-WA-0302W
Cleanert MAS-A	96-well plate	30 mg/2 mL/well (2/pk)	MS-A-0302W
Cleanert MAS-B	MAS Purification Cartridge	30 mg/mL (100/pk)	MSC-B-0301
Cleanert MAS-WA	MAS Purification Cartridge	30 mg/mL (100/pk)	MSC-WA-0301
Cleanert MAS-A	MAS Purification Cartridge	30 mg/mL (100/pk)	MSC-A-0301

Cleanert Peptide Dedicated Plate of Solid Phase Extraction

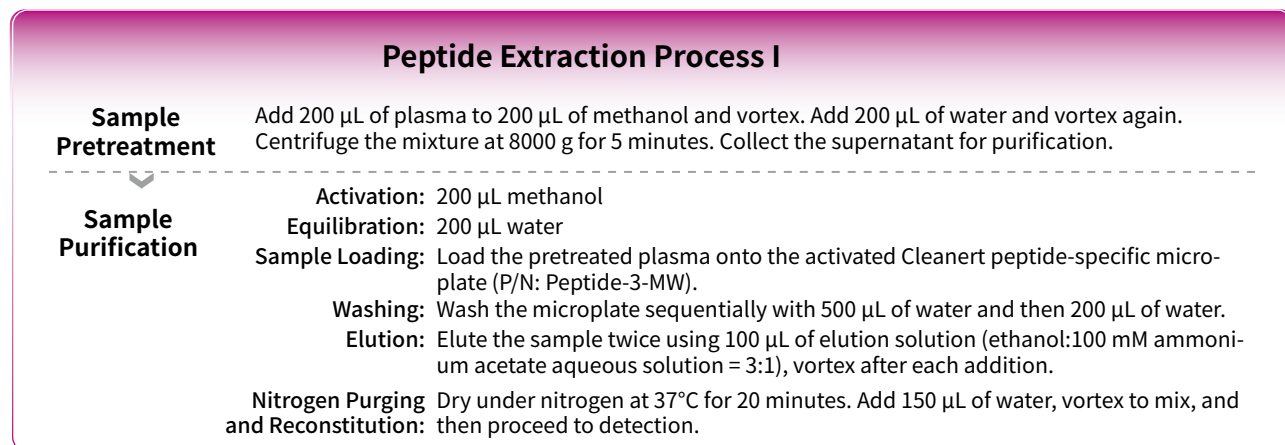
Description

Based on the Cleanert polymer matrix, Agela has developed the Cleanert Peptide, a series of dedicated solid-phase extraction plate for peptides, which provides an orthogonal method for the purification and enrichment of peptide drugs in biological samples such as plasma.

Features



Operation Process



Analysis of Various Peptides in Plasma

Name	Molecular Weight	pI	Relative Recovery Rate (External Standard Method) (%)	RSD % (n=5)
Angiotensin I	1296.48	7.51	75.6	7.6
Octreotide	1079.3	9.3	83.5	6.3
Angiotensin II	1046.18	7.35	93.0	8.6
Desmopressin	1129.28	8.6	92.1	3.7
Vasopressin	1056.22	9.1	84.6	6.4
Neurophysin	1732.98	10.9	83.0	5.1
Gosherelin	1269.41	9.82	96.3	3.7
Insulin aspart	5824.60	5.1	96.4	3.3

Chromatographic Conditions:

Chromatographic Column: Luna Omega 1.6 μ m Polar C18

Specifications: 2.1 $\times$ 50 mm

Part Number: 00B-4748-AN

Mobile Phase: A: 0.1% formic acid 5 mM ammonium acetate aqueous solution

B: 0.1% formic acid acetonitrile solution

Flow Rate: 0.3 mL/min

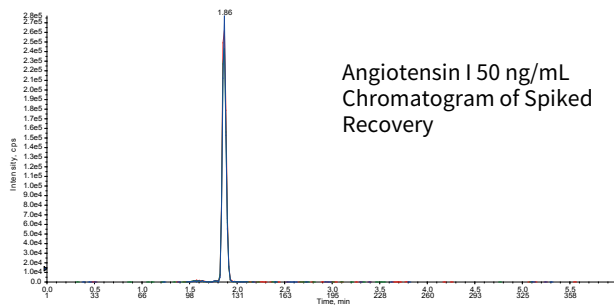
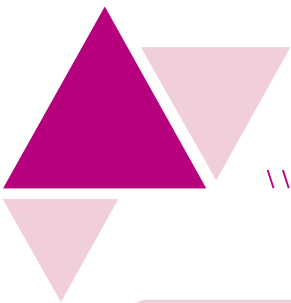
Column Temperature: 40 °C

Injection Volume: 10 μ L

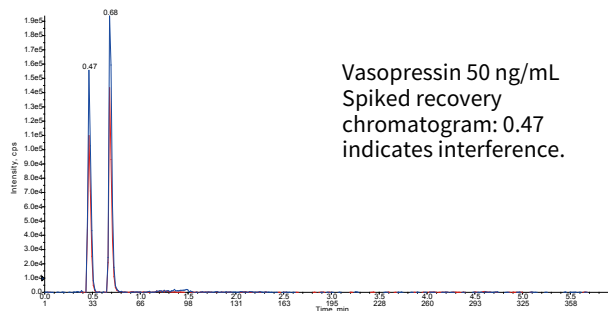
Detection: SCIEX 5500, ESI+, MRM

Gradient:

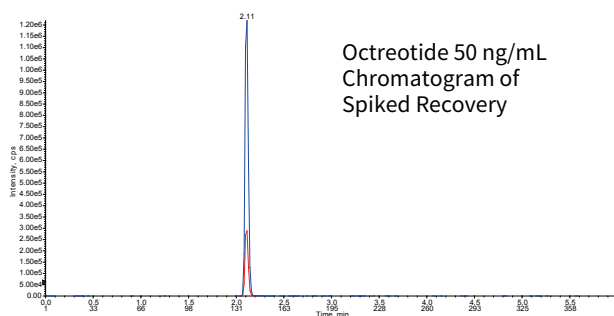
Time	B%
0.0	20
0.5	20
3.0	50
3.2	98
4.1	98
4.3	20
6.0	20



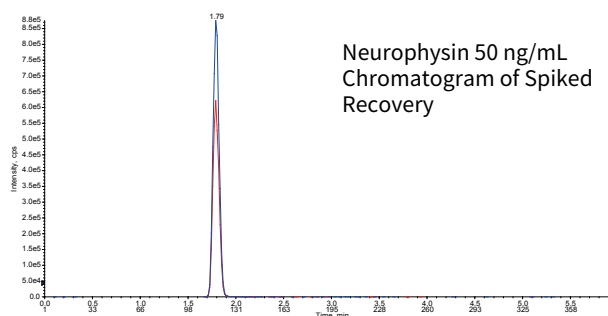
Angiotensin I 50 ng/mL
Chromatogram of Spiked
Recovery



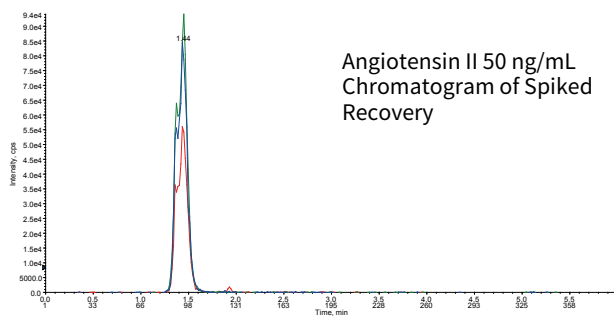
Vasopressin 50 ng/mL
Spiked recovery
chromatogram: 0.47
indicates interference.



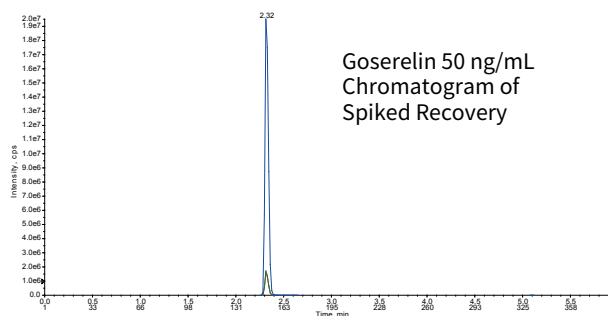
Octreotide 50 ng/mL
Chromatogram of
Spiked Recovery



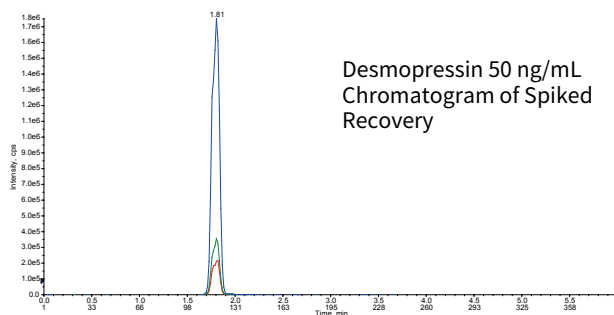
Neurophysin 50 ng/mL
Chromatogram of Spiked
Recovery



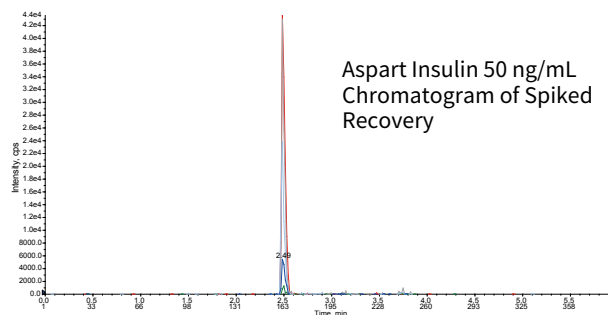
Angiotensin II 50 ng/mL
Chromatogram of Spiked
Recovery



Goserelin 50 ng/mL
Chromatogram of
Spiked Recovery



Desmopressin 50 ng/mL
Chromatogram of Spiked
Recovery



Aspart Insulin 50 ng/mL
Chromatogram of Spiked
Recovery

Peptide Extraction Process II

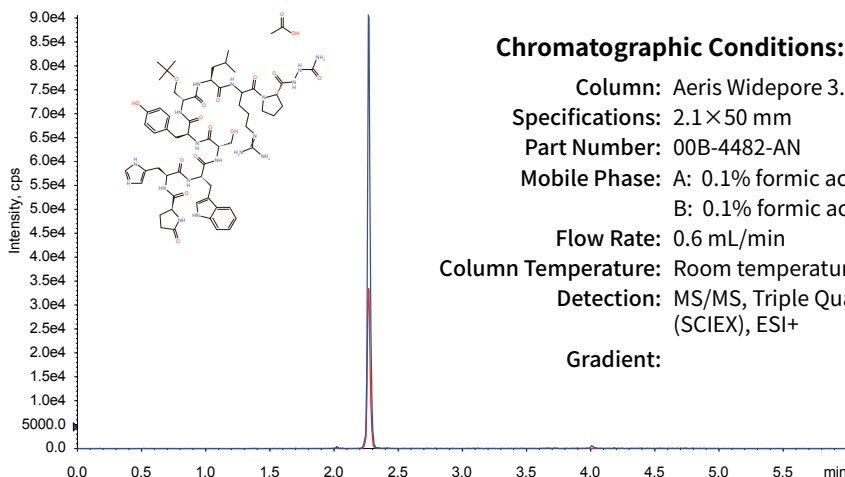
Sample Pretreatment

Add 200 μ L of plasma to 200 μ L of 2% aqueous ammonia solution, vortex, and let it stand for purification.

Sample Purification

Activation: 200 μ L Methanol
Equilibration: 200 μ L Water
Sample Loading: Load the pretreated plasma onto the activated Cleanert peptide-specific microplate (P/N:Peptide-1-MW)
Washing: Wash the microplate sequentially with 500 μ L of water and then 200 μ L of water.
Elution: Elute the sample twice using 100 μ L of elution solution (2% formic acid ethanol: water=3:1), vortexing after each addition.
Nitrogen Purging and Reconstitution: After drying with nitrogen at 37°C for 20 minutes, add 150 μ L of water, vortex to mix for detection.

Analysis of Goserelin in Plasma



Chromatographic Conditions:

Column: Aeris Widepore 3.6 μ m XB-C18
Specifications: 2.1 $\times$ 50 mm
Part Number: 00B-4482-AN
Mobile Phase: A: 0.1% formic acid aqueous solution
 B: 0.1% formic acid methanol solution
Flow Rate: 0.6 mL/min
Column Temperature: Room temperature
Detection: MS/MS, Triple Quad™ 4500 (SCIEX), ESI+
Gradient:

Time	B%
0.00	10
3.00	95
4.00	95
4.01	10
6.00	10

Note: For complete experimental reports and data, please contact the sales team.

Ordering Information

Product Name	Type	Unit	Part Number
Peptide Detection Plate 1	96 micro-well plate	5 mg/1 mL/well (2/pk)	Peptide-1-MW
Peptide Detection Plate 2	96 micro-well plate	5 mg/1 mL/well (2/pk)	Peptide-2-MW
Peptide Detection Plate 3	96 micro-well plate	5 mg/1 mL/well (2/pk)	Peptide-3-MW
Peptide Detection Plate 4	96-well plate	50 mg/2 mL/well (2/pk)	Peptide-4-W
Peptide Detection Plate 5	96-well plate	50 mg/2 mL/well (2/pk)	Peptide-5-W



Magnetic Beads for Biological Sample Preparation

Cleanert MagBeads Magnetic Beads for Solid Phase Extraction

Simple! Fast! Purified! Precise! Stable! Cost-Effective!

The Cleanert solid-phase extraction (SPE) MagBeads series is designed with polymer materials that are coated on the surface of magnetic microspheres, with different bonding phases. This enables efficient capture of trace amounts of target analytes from complex sample matrices while solving common issues in traditional solid-phase extraction products during sample preparation process, such as complicated operations, long processing time, and blocking. As a result, the separation and concentration process becomes simpler, faster, and more efficient. The MagBeads offer advantages including simple operation, short extraction time, solvent savings, rapid solid-liquid separation, superparamagnetism, fast magnetic response, high reproducibility, and easy automation. They are suitable for sample purification in clinical, research, food, environmental and other applications.

Features

- Uniform particle size distribution with excellent dispersibility
- Simple operation, easy to automate
- Strong stability with high batch-to-batch reproducibility
- Short extraction time with high extraction efficiency

Parameter Information

Solid Phase	PEP	pH Range	1~14
Particle Size	15-50 μm	Magnetic Core	Fe_3O_4
Surface Area	750 m^2/g	Shell	Polymer
Pore Size	60 $\text{\AA}$	Surface Functional Group	Phenyl, pyrrolidone
Applicability	It has broad general applicability and is suitable for the separation of non-polar and weak polar compounds, especially weak polar small molecule drugs with hydrophobic groups such as benzene rings, aromatic rings, heterocycles, and weak basic drugs.		

Application Fields



Clinical in vitro small molecule biomarker research

- **Hormones**
Cluding mineralocorticoids, glucocorticoids, sex hormones, etc.
- **Bile acids**
- **Aldosterone, renin, angiotensin I**
- **Thyroid hormones**
- **Blood concentration testing**



Physicochemical Safety Analysis of Food and Cosmetics

- **Detection of pesticide and veterinary drug residue in food and agricultural products**
- **Detection of illegal additives in food**
- **Detection of anabolic agents in food and cosmetics**
- **Detection of natural toxins in food and agricultural products**



Environmental Testing

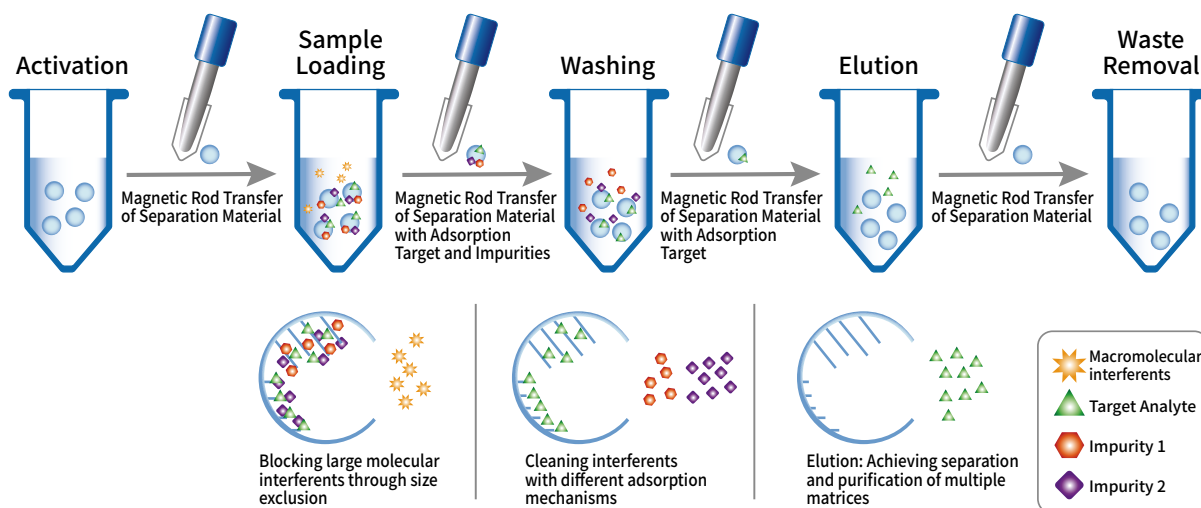
- **Detection of various harmful compounds in soil and riverbed sediments**
- **Detection of phenolic compounds, organophosphorus pesticides, sex hormones, and other substances in water**



Forensic Toxicology Testing

- **Detection of psychotropic drugs in body fluids and tissues**
- **Detection of drugs and metabolites in body fluids and tissues**
- **Detection of the content of drug compounds**

Extraction Process



Application Case Study: Analysis Method of Eight Steroid Hormones in Serum

This experiment used PEP magnetic beads for pretreatment of serum samples, calibrated by external standard method, and quantified 8 hormones in serum. The method has good linearity, spiked recovery and precision meet relevant requirements, and can be used as a reference for the detection of clinical samples.

Sample Extraction

Take 200 μL of serum, add 200 μL of 2% formic acid solution, vortex for 1 minute, and let it stand for purification.

Sample Purification

Activation: Pipette 100 μL of the pre-diluted magnetic bead solution (concentration: 20 mg/mL) into a 2 mL centrifuge tube and place it on a magnetic bead separator, making the magnetic beads stick to the wall until the beads are separated from the suspension and the suspension is clarified. Dispose of the supernatant, and then activate the beads with 200 μL of methanol and 200 μL of water, and discard the supernatant.

Sample Loading: Transfer all the pretreated sample to the centrifuge tube containing the activated magnetic beads. Vortex for 1 minute and let stand for 1 minute. Place the tube on the magnetic separator, allowing the beads to adhere to the tube wall until the beads are separated from the suspension, leaving a clear supernatant. Discard the supernatant.

Washing: Elute twice using 200 μL of a 2% formic acid solution.

Elution: Add 200 μL anhydrous ethanol to the centrifuge tube containing the magnetic beads, vortex for 1 minute, let it stand for 1 minute, place it on the magnetic bead separator to allow the beads to adhere to the wall for 1 minute until the beads separate from the suspension, the suspension clears up. Take all the supernatant, add 200 μL of water for dilution, vortex for 1 minute, ready for testing.

Experimental Results

LC Conditions

Column: Kinetex 2.6 μ m C18, 3.0 $\times$ 100 mm
Cat. No.: 00D-4462-Y0
Mobile Phase: A: 0.5 mmol/L ammonium fluoride buffer solution
 B: Methanol
Flow Rate: 0.6 mL/min
Column Temperature: 40 $^{\circ}$ C
Injection Volume: 20 μ L
Gradient:

Time (min)	B (%)
0	30
2.5	55
8.2	85
9.7	85
10	30
12	30

MS Conditions

Ion Source Type: Electrospray Ionization Source (ESI+)
Scanning Mode: Multiple Reaction Monitoring (MRM) positive and negative ion mode
Spray Needle Voltage: 5500 V
Ion Source Temperature: 550 $^{\circ}$ C
Heater (GS1): 50 psi
Auxiliary Heating Gas (GS2): 50 psi
Curtain Gas (CUR): 35 psi
Collision Gas (CAD): 10 psi

To achieve better stability and sensitivity, parameters such as the declustering potential (DP) and collision energy (CE) for each compound's monitored ion pair, the quantitative ion pair for the target compounds, and the internal standard monitoring ion pair have all been systematically optimized. Please refer to Table 2 for the optimization details. The parameters in this case are provided for reference only.

Table 2. Qualitative and Quantitative Ion and Mass Spectrometry Analysis Parameters of Compounds

Compound	Q1	Q3	DP/V	CE/V
Testosterone	289.2*	97.3*	100	31
	289.2	109.3	100	36
Progesterone	315.2*	97.1*	160	27
	315.2	109.2	160	15
11-Deoxycorticosterone	347.2*	97.1*	100	33
	347.2	109.1	100	45
Corticosterone	347.2*	121.2*	80	33
	347.2	91.3	80	80
Androstenedione	287.1*	97.1*	80	30
	287.1	109.1	80	30
Deoxycorticosterone	331.2*	97.1*	80	30
	331.2	109.1	80	30
Dehydroepiandrosterone	271.2*	253.3*	60	18
	271.2	196.9	60	25
Pregnenolone	299.0*	159.3*	140	34
	299.0	133.1	140	35

Note: In Table 2, "*" indicates a quantitative ion.

Table 3. Spiked Recovery Experiment Results of Matrix (N=9)

Compound	Theoretical Spiked Amount (ng/mL)	Detection Result (ng/mL)	Average Recovery Rate (%)	RSD%
Testosterone	2	1.75	87.28	5.06
	10	8.20	82.00	4.82
Progesterone	4	2.98	74.62	5.82
	20	15.34	76.69	4.41
11-Deoxycorticosterone	4	3.36	84.07	4.34
	20	15.98	79.89	2.66
Corticosterone	4	3.48	87.08	6.60
	20	16.93	84.63	5.08
Androstenedione	2	1.56	78.24	4.89
	10	7.79	77.89	4.10
Deoxycorticosterone	2	1.71	85.52	4.47
	10	8.42	84.18	3.74
Dehydroepiandrosterone	40	38.63	96.64	3.56
	80	77.50	96.92	5.36
Pregnenolone	40	34.41	86.03	6.56
	80	62.40	77.96	3.35

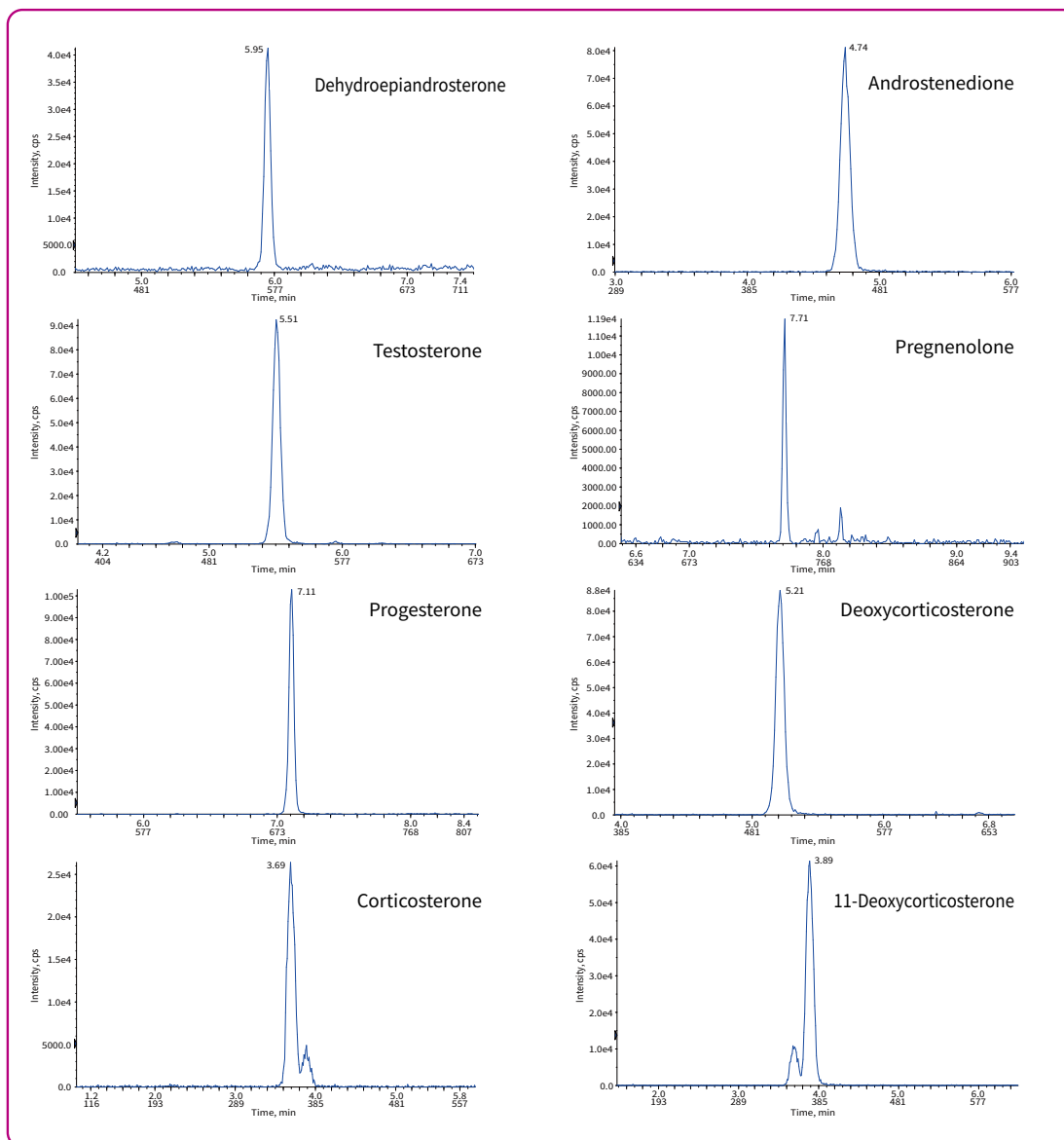
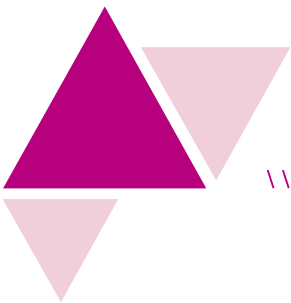


Figure 1. Quantitative Ion Chromatogram of Spiked Serum Matrix



Application Case Study: Analysis Method of 15 Bile Acids in Serum

The experiment employed PEP magnetic beads for the pretreatment of bovine serum samples, utilized the internal standard method for calibration, and conducted qualitative and quantitative verification of 15 bile acids in the serum. The method demonstrated good linearity, spiked recovery, and precision, making it a reference for the testing of clinical actual samples.

Sample Extraction

Take 200 μ L of bovine serum and add 200 μ L of 2% formic acid solution. Vortex for 1 minute and allow it to purify.

Sample Purification

Activation: Transfer 200 μ L of the pre-diluted magnetic bead solution (concentration: 20 mg/mL) to a 2.0 mL centrifuge tube. Place the tube on a magnetic bead separator, allowing the beads to adhere to the tube wall. Wait until the magnetic beads are separated from the suspension, leaving a clear supernatant. Discard the supernatant. Subsequently, activate the magnetic beads by washing them with 200 μ L of methanol and then 200 μ L of water, discarding the supernatant after each wash.

Sample Loading: Transfer all pretreated samples to the activated magnetic bead centrifuge tube. Vortex for 1 minute and let stand for 1 minute. Place the tube on the magnetic bead separator, allowing the beads to migrate to the side of the tube and separate from the suspension until the supernatant is clear. Discard the supernatant.

Rinsing: Add 400 μ L of 2% formic acid solution and vortex for 1 minute. Place the tube on the magnetic bead separator, allowing the beads to migrate to the side of the tube and separate from the suspension until the supernatant is clear. Discard the supernatant.

Elution: Add 200 μ L of 1% ammonia in methanol to the magnetic bead centrifuge tube and vortex for 1 minute. Let stand for 1 minute. Place the tube on the magnetic bead separator, allowing the beads to migrate to the side of the tube and separate from the suspension for 1 minute, or until the supernatant is clear. Collect all of the supernatant and dry it under nitrogen at 35° C. Reconstitute the residue in 50% methanol for measurement.

Experimental Results

LC Conditions

Column: Kinetex 2.6 μ m EVO C18, 2.1 $\times$ 100 mm
Cat. No.: 00D-4725-AN
Mobile Phase: A: 5 mmol/L ammonium acetate buffer solution
B: Methanol
Flow Rate: 0.4 mL/min
Column Temperature: 40 °C
Injection Volume: 10 μ L
Gradient:

Time (min)	B (%)
0	30
2.5	55
8.2	85
9.7	85
10	30
12	30

MS Conditions

Ion Source Type: Electrospray ionization source (ESI)
Scanning Mode: Multiple Reaction Monitoring (MRM) in positive and negative ion mode
Spray Needle Voltage: -5500 V
Ion source temperature: 550 °C
Heater (GS1): 50 psi
Auxiliary Heating Gas (GS2): 50 psi
Curtain Gas (CUR): 35 psi
Collision Gas (CAD): 10 psi

To obtain optimal stability and sensitivity, the declustering voltage (DP) and collision voltage (CE) were systematically optimized for each compound's monitoring ion pair, including the quantitative ion pair of the target compound and the internal standard monitoring ion pair. Optimization information is shown in Table 2. The experimental parameters provided in this case study are for reference only.

Table 2. Qualitative and Quantitative Ion and Mass Spectrometry Analysis Parameters of Compounds

Compound	Q1	Q3	DP/V	CE/V
CA	407.1	343.3	-165	-40
	407.1*	407.1*	-165	-48
GCA	464.3	74.1	-150	-75
	464.3*	464.3*	-150	-15
GUDCA	448.3*	74.2*	-150	-70
	448.3	386.1	-150	-50
TCA	514.3	79.9	-200	-135
	514.3*	124.1*	-200	-67
TUDCA	498.3	80.2	-210	-130
	498.3*	498.4*	-210	-35
UDCA	391*	391*	-100	-27
CDCA	391.3*	391.3*	-160	-24
	391.3	355.2	-160	-46
GCDCA	448.3*	74.1*	-150	-72
	448.3	386.4	-150	-47
TCDCA	498.3	80	-200	-130
	498.3*	498.3*	-200	-35
TDCA	498.3*	80.1*	-210	-133
	498.3	355.1	-210	-67
DCA	391.3*	345.2*	-165	-46
LCA	374.9*	374.9*	-210	-30
	374.9	375.3	-210	-48
TLCA	482.5*	80*	-180	-135
	482.5	124	-180	-63
GLCA	432.3*	74*	-180	-60
	432.3	432.3	-180	-144
GDCA	448.3*	74*	-150	-75
CA-d4	411.3	411.3	-165	-48
DCA-d4	395.3	395.1	-165	-46
CDCA-d4	395.3	395.2	-160	-24
UDCA-d4	395.3	395.3	-100	-27
LCA-d4	379.1	379.1	-210	-30
GCA-d4	468.3	74.1	-150	-75
GUDCA-d4	452.3	73.9	-150	-70
TCDCA-d4	502.3	79.9	-200	-130
TUDCA-d4	502.1	80.1	-210	-130
GLCA-d4	436.4	74	-180	-60
TDCA-d4	502.3	79.8	-210	-133
GCDCA-d4	452.6	73.8	-150	-72
GDCA-d4	452.5	74	-150	-75
TCA-d4	517.7	124	-200	-135
TLCA-d4	486	80	-180	-83

Note: In Table 2, "*" indicates a quantitative ion.

Table 3: Spiked Recovery Experiment Results of Matrix (N=6)

Compound	Added Concentration (ng/mL)	Average Recovery Rate (%)	RSD%
CA	50	108.38	5.23
	200	102.40	3.49
GCA	25	104.47	4.47
	100	97.32	2.33
GUDCA	50	100.70	4.72
	200	96.62	2.27
TCA	500	111.00	5.92
	2000	102.45	5.03
TUDCA	25	111.50	3.92
	100	101.20	3.55
UDCA	25	105.12	4.21
	100	101.35	2.09
CDCA	25	86.12	4.29
	100	90.68	3.24
GCDCA	50	104.08	5.14
	200	98.42	1.69
TCDCA	25	111.83	5.23
	100	101.35	2.07
TDCA	500	113.83	3.79
	2000	104.17	2.74
DCA	50	94.17	5.68
	200	98.17	3.25
LCA	50	101.32	8.08
	200	121.83	5.18
TLCA	500	101.07	5.60
	2000	94.27	1.01
GLCA	50	103.55	5.76
	200	101.75	3.13
GDCA	25	107.52	4.32
	100	101.57	4.50

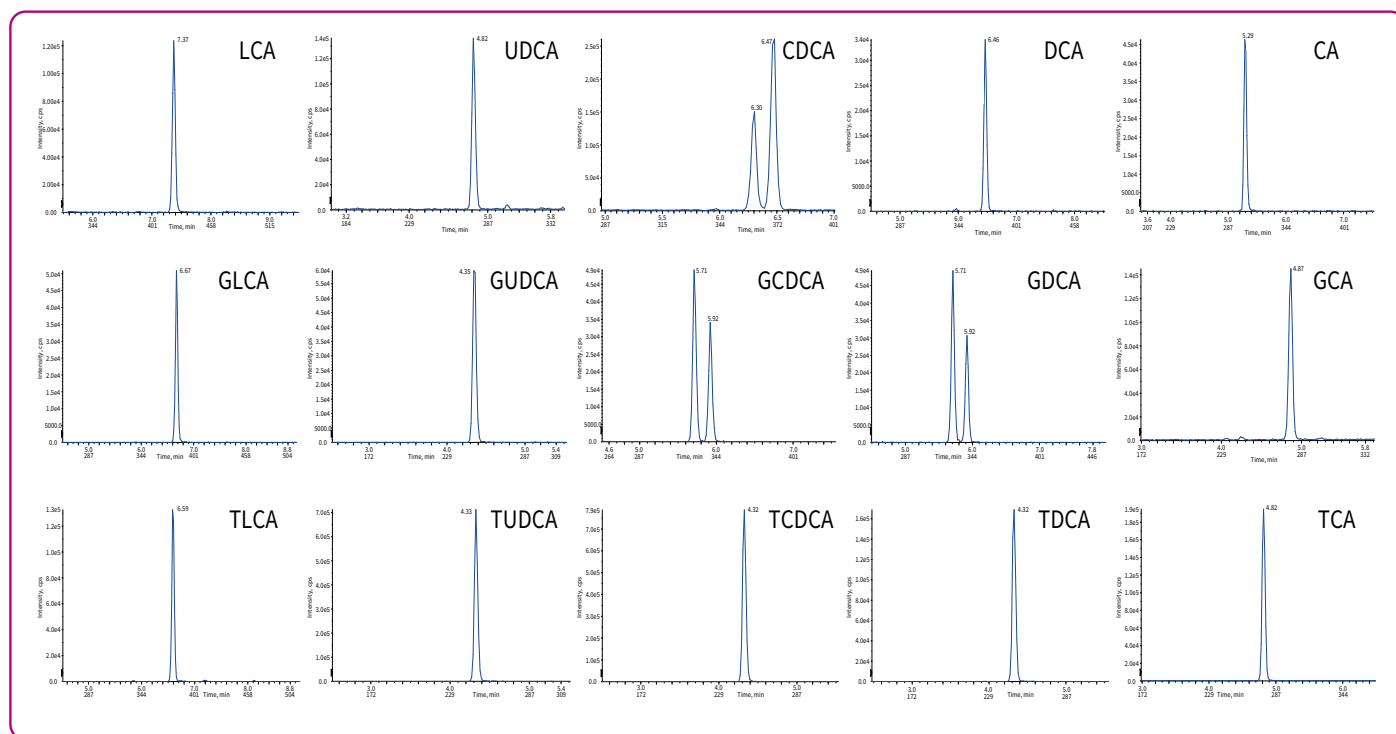
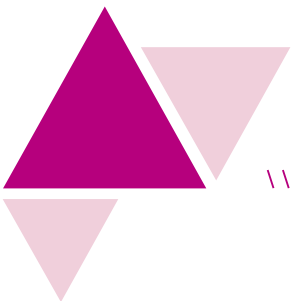


Figure 1: Quantitative Ion Chromatogram of Bile Acids in Serum Samples

Ordering Information

Product Name	Type	Unit	Part Number
Cleanert PEP MagBeads	Sorbent	1 g/bottle	MBPE10001
		5 g/bottle	MBPE10005
		10 g/bottle	MBPE10010
		50 g/bottle	MBPE10050
		100 g/bottle	MBPE10100

Agela Dedicated Columns



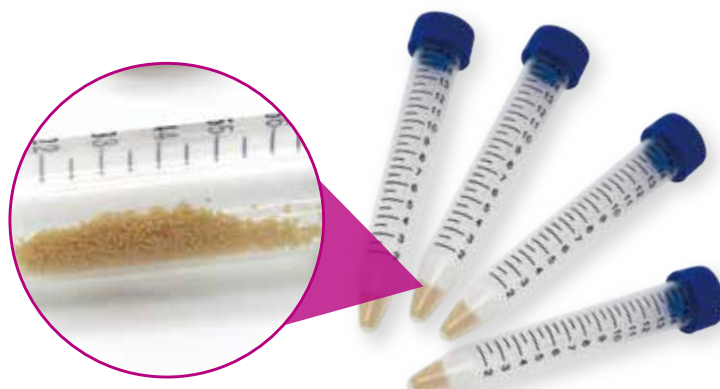
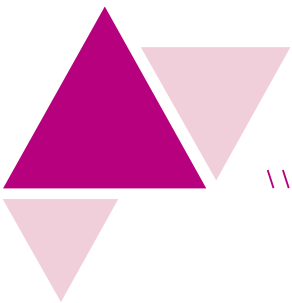
Cleanert LipoNo

Dedicated Column for Veterinary Drug Residue Detection in Animal-Derived Food

During LC-MS analysis of veterinary drug residues in samples of animal origin, lipids present in the samples can interfere with analyte detection. Lipids often exhibit matrix enhancement or suppression effects on LC-MS analysis, leading to significant discrepancies between measured and actual compound recovery rates, which affects the calculation of recovery and leads to large deviations between the test data and the actual results.

Cleanert LipoNo is a new lipid removal material developed by Bonna-Agela Technologies Inc. The surface of the sorbent is modified with many long carbon chains, which can selectively adsorb fats. It uses the QuEChERS approach for pretreatment of samples with high lipid content, such as meat, eggs, and milk, enabling effective lipid removal while ensuring good recovery of veterinary drugs. The method is simple and convenient to operate and is suitable for processing a large number of samples.





Cleanert LipoNo, composed of large particles, eliminates the need for centrifugation. Layering occurs naturally upon standing, further simplifying the operation.

Our innovative sorbent production process utilizes large particles that allow for natural layering upon standing, saving valuable operation time.

Traditional QuEChERS

Homogenize the sample and add the extraction solvent

Mixing and ultrasonic centrifugation to obtain the supernatant

The C18/PSA sorbent purification sample

Mix and centrifuge

Collect the supernatant and reconstitute using nitrogen blowdown

Cleanert LipoNo

Homogenize the sample and add the extraction solvent

Mixing and ultrasonic centrifugation to obtain the supernatant

Cleanert LipoNo purification sample

Mix and allow to stand for layering

Collect the supernatant and reconstitute using nitrogen blowdown

Ordering Information

Product Name	Type	Unit	Part Number
Cleanert LipoNo	Centrifuge Tube	15 mL centrifuge tubes (50/Pk)	MS-LN0415

Highly selective adsorption effect on lipid-based substrates, effectively reducing sample matrix effects caused by lipids.

Cleanert LipoNo effectively adsorbs monoglycerides, diglycerides, and triglycerides, demonstrating superior lipid removal compared to other sorbent.

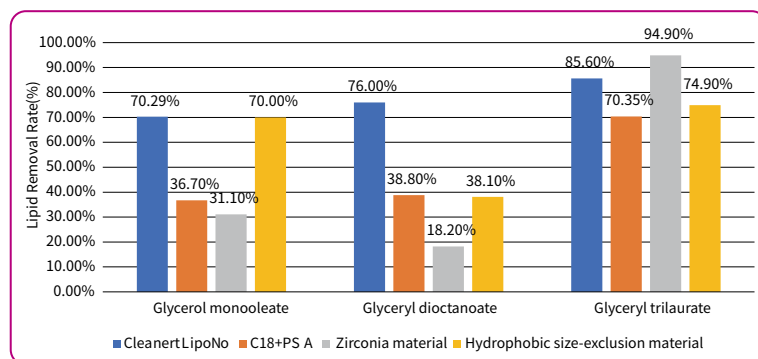
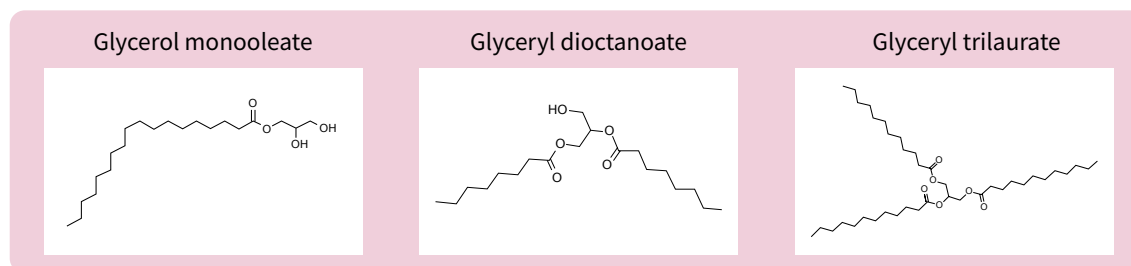


Figure 1. The lipid removal performance was evaluated by observing the removal effects of four different sorbents including Cleanert LipoNo, C18+PSA (mass ratio 1/1), zirconium oxide and hydrophobic size exclusion material, each weighing 1g, on monoglyceride, diglyceride and triglyceride. The comprehensive lipid removal effect of Cleanert LipoNo was better than that of the other three sorbents.

The removal effects of Cleanert LipoNo and the other three materials on the matrix of chicken tissue were investigated. The final extracts before and after purification were subjected to GC/MS full scans, and the full scan chromatograms were integrated. The sample matrix removal rate was calculated according to the formula. The results showed that among the four materials, CleanertLipoNo could more effectively remove matrix interference in chicken samples.

$$\text{Sample matrix removal rate (\%)} = \frac{\text{Total peak area of unpurified sample} - \text{Total peak area of evolved sample}}{\text{Total peak area of unpurified sample}} \times 100$$

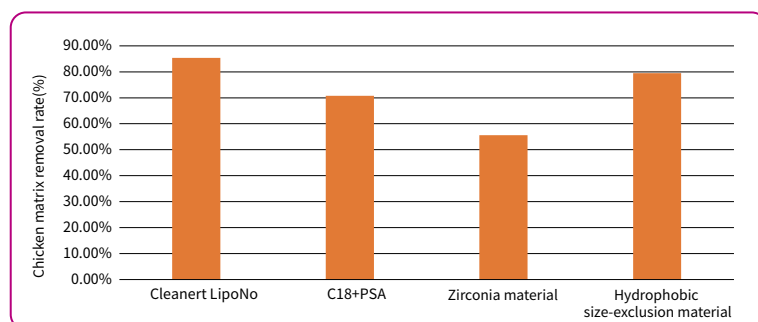


Figure 2. GC-MS full scan analysis results showing the matrix removal efficiency (%) of three different sorbents used to purify chicken tissue. The results indicate that Cleanert LipoNo is more effective at removing matrix interference from chicken samples.

With no excessive adsorption of common veterinary drug compounds, it is suitable for the rapid and simultaneous detection of multiple veterinary drug residues.

The post-addition experiment using chicken samples ruled out the influence of extraction efficiency and adsorption of veterinary drugs by the material itself. The improvement in recovery rate brought about by removing the matrix effect of the sample can be intuitively observed.

Four materials, namely Cleanert LipoNo, C18+PSA (mass ratio 1/1), zirconia material, and hydrophobic size exclusion material, were used to process the chicken meat samples with the same pretreatment method. Subsequently, 13 sulfonamide veterinary drugs (spiked concentration of 20 ppb) were added. The recovery rates of the 13 sulfonamide drugs were obtained by comparing them with the standards without the sample matrix. The results showed that Cleanert LipoNo was more effective in reducing the matrix effect, and the data stability was better.

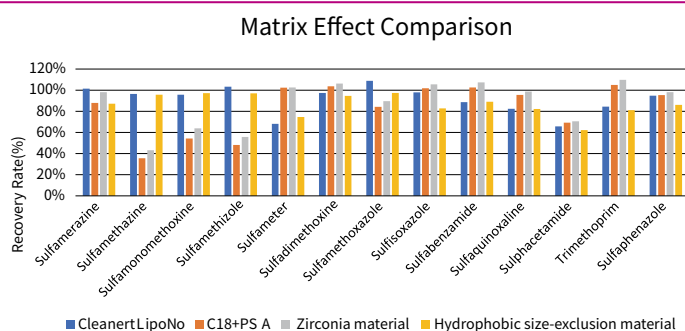


Figure 3. Matrix effect results of sulfonamides. The matrix effect on chicken tissue samples purified by Cleanert LipoNo was lower than that on samples treated with C18+PSA (1:1 mass ratio), zirconia material, and hydrophobic size exclusion material.

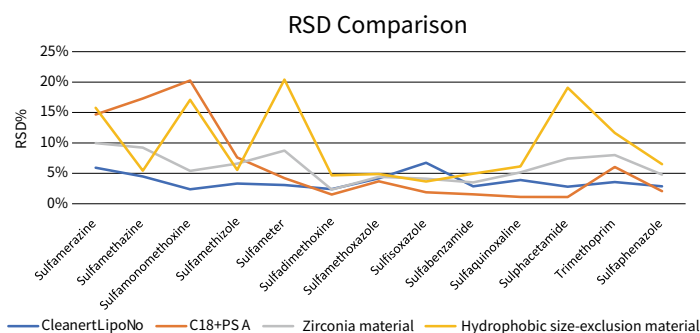


Figure 4. The RSD results of the recovery rate of sulfonamides show that the data stability of the chicken tissue sample purified by Cleanert LipoNo is better than that of the samples treated with C18+PSA (mass ratio 1/1), zirconium oxide material and hydrophobic size exclusion material.

Table 1. Recovery Rates and RSD Results for Sulfonamides (n=6)

Drug Name	Average Recovery Rate (n=6)				RSD (n=6)			
	Cleanert LipoNo	C18+PSA	Zirconia material	Hydrophobic Size Exclusion Material	Cleanert LipoNo	C18+PSA	Zirconia material	Hydrophobic Size Exclusion Material
Sulfamerazine	101%	88%	98%	87%	6%	15%	10%	16%
Sulfamethazine	96%	36%	43%	96%	5%	17%	9%	5%
Sulfamonomethoxine	96%	54%	64%	97%	2%	20%	5%	17%
Sulfamethizole	103%	48%	56%	97%	3%	8%	7%	6%
Sulfameter	68%	102%	103%	75%	3%	4%	9%	20%
Sulfadimethoxine	97%	104%	106%	95%	2%	2%	2%	5%
Sulfamethoxazole	109%	84%	90%	97%	4%	4%	4%	5%
Sulfisoxazole	98%	102%	106%	83%	7%	2%	4%	4%
Sulfabenzamide	89%	103%	107%	89%	3%	2%	4%	5%
Sulfaquinoxaline	82%	96%	99%	82%	4%	1%	5%	6%
Sulphacetamide	66%	69%	71%	62%	3%	1%	7%	19%
Trimethoprim	84%	105%	110%	81%	4%	6%	8%	12%
Sulfaphenazole	95%	95%	98%	86%	3%	2%	5%	7%

Application Case Study: Rapid Detection Method for Nine B-Agonists in Animal-Derived Food

The common extraction and purification methods for β -agonist detection are liquid-liquid extraction and solid phase extraction, which are cumbersome and time-consuming. In this experiment, Cleanert LipoNo was used to purify and remove the lipid, and a rapid method was established for the determination of 9 β -agonists in three matrices, namely, pork rump, beef hindquarter and mutton shank. In the experiment, the samples were homogenised and enzymatically digested, extracted with ammoniated acetonitrile, cleaned with Cleanert LipoNo, detected by LC-MS/MS, separated by Kinetex F5 and quantified by external standard method. The results showed that the recoveries of pork rump, beef hindquarter and mutton shank were more than 70% with the RSD less than 20%, which met the experimental requirements.

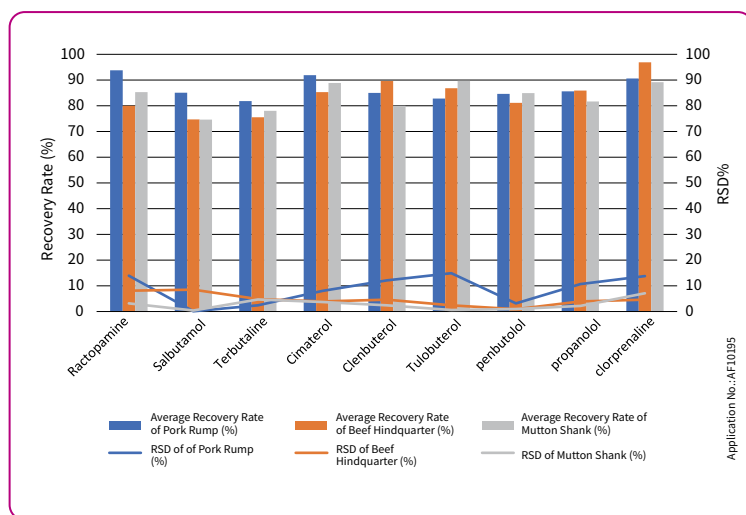


Figure 5 The recoveries and RSD results of the nine β -agonists. At the spiked level of 5 $\mu\text{g/Kg}$, the recoveries were more than 70% and the RSDs were less than 20% for pork rump, beef hindquarter and mutton shank, which could meet the requirements of the detection.

Table 2. Spiked Recovery Experiment Results of Nine Agonists in Muscle Tissue (Spiked Concentration: 5 $\mu\text{g/Kg}$)

Drug Name	Pork Rump		Beef Hindquarter		Mutton Shank	
	Average Recovery Rate (%)	RSD%	Average Recovery Rate (%)	RSD%	Average Recovery Rate (%)	RSD%
Ractopamine	93.8	13.9	80.0	8.1	85.3	3.2
Salbutamol	85.1	0.1	74.7	8.5	74.6	0.4
Terbutaline	81.8	2.4	75.5	4.8	78.0	4.7
Cimaterol	91.9	8.0	85.3	3.9	88.9	3.7
Clenbuterol	85.0	12.1	89.6	4.6	80.0	2.4
Tulobuterol	82.8	14.9	86.8	2.4	89.7	0.6
Penbutolol	84.6	3.2	81.1	0.9	84.9	1.0
Propanolol	85.6	10.7	85.9	3.9	81.7	2.2
Clorprenaline	90.6	13.8	96.9	4.6	89.2	7.1

Application: Analysis Method for 131 Veterinary Drug Residues in Chicken Meat

This experiment established a method for determining 131 veterinary drug residues in chicken meat using QuEChERS combined with high-performance liquid chromatography-tandem mass spectrometry (LC-MS/MS). The samples were extracted with 0.1 mol/L EDTA-2Na aqueous solution and acetonitrile, purified using Cleanert LipoNo (Cat. No.: MS-LN0415), detected by LC-MS/MS, and separated using Venusil MP C18 (Cat. No.: VA930503-0). Quantification was performed using the external standard method. The results indicated that the recovery rates for the 131 veterinary drugs ranged from 60% to 120%, with an RSD below 20%, meeting the detection requirements.

Sample Extraction

Weigh 2.5 g of homogenised sample in a 50 mL centrifuge tube, add 2 mL of 0.1 mol/L EDTA 2Na aqueous solution, vortex for 1 min, then add 8 mL of acetonitrile, vortex for 1 min, sonicate for 15 min, and centrifuge at 8000 rad/min for 5 min, and then leave the supernatant to be purified.

Sample Purification

Take 3 mL of the supernatant and add it to a Cleanert LipoNo purification tube. Shake for 1 minute, then let it stand for 1 minute. Afterwards, take 0.4 mL of the supernatant, add 0.8 mL of water (the dilution factor can be determined based on the experimental conditions), mix well, and pass it through a 0.22 µm polyethersulfone syringe filter before proceeding to LC-MS/MS analysis.

Preparation of Matrix- Mixed Standard Working Solution

Take a high-concentration mixed veterinary drug standard solution and dilute it with a blank sample matrix solution to obtain a low-concentration matrix-mixed standard working solution.

Experimental Results

As shown in Table 3, the QuEChERS method combined with liquid chromatography-tandem mass spectrometry (LC-MS/MS) was used to detect 131 veterinary drug residues in chicken. The recoveries ranged from 60% to 120%, meeting the detection requirements. The figure demonstrates that using the Venusil MP C18 column for the analysis of multiple veterinary drug residues resulted in good peak shapes and stable retention times.

Table 3. Spiked Recovery Experiment Results for 131 Veterinary Drug Residues in Chicken (n=3)

Analyte	Average Recovery Rate (%)	RSD/%	Spiking Level (mg/kg)	Retention Time (min)	Analyte	Average Recovery Rate (%)	RSD/%	Spiking Level (mg/kg)	Retention Time (min)
Medroxyprogesterone Acetate	64.6	18	0.01	11.5	Beclomethasone	93.9	16	0.01	8.13
Estradiol	118	4.2	0.02	4.42	Flumethasone	96.4	13.9	0.01	8.04
Estrinol	80.5	0.2	0.02	4.93	Methylprednisolone Acetate	79	10.8	0.01	9.25
Glipizide	99.8	11.8	0.01	8.88	Flumethasone Acetate	82.8	10.2	0.01	9.7
Repaglinide	78.1	12.6	0.01	12.45	Fludrocortisone Acetate	92	8.1	0.01	8.87
Toluene Sulfonfyl Butylurea	90.4	7.6	0.01	9.06	Budesonide	82.4	5.7	0.01	9.45
Prednisone	92.6	11.5	0.01	7.22	Hydrocortisone Butyrate	72.7	10.8	0.01	9.47
Cortisone	88.6	8.5	0.01	7.37	Triamcinolone	89.3	10	0.01	8.27
Hydrocortisone	86	11.5	0.01	7.22	Fludrocortisone	79	1.3	0.01	8.55
Methylprednisolone	96.9	7.6	0.01	7.73	Deflazacort	78.4	9.3	0.01	8.72
Fluorometholone	82.2	9.3	0.01	8.8	Hydrocortisone valerate	76.6	7.6	0.01	10.1
Betamethasone	101.2	11.7	0.01	7.91	Triamcinolone acetate	72.9	5.6	0.01	10.2
Triamcinolone	86.3	5.6	0.01	5.87	Diflorasone diacetate	108.3	6.1	0.01	10.3
Prednisone acetate	74	18	0.01	8.95	Ancinaide	106.1	17.3	0.01	11.1
Cortisone acetate	92.4	12.3	0.01	9.1	Triamcinolone diacetate	71.1	2.9	0.01	8.57
Hydrocortisone acetate	74.7	6.2	0.01	8.8	Prednisolone	94.5	10.4	0.01	7.07

Table 3. Spiked Recovery Results for 131 Veterinary Drug Residues in Chicken (n=3) (Continued)

Analyte	Average Recovery Rate (%)	RSD/%	Spiking Level (mg/kg)	Retention Time (min)
Dexamethasone	92.9	7.6	0.01	7.88
Prednisolone acetate	77.2	8.3	0.01	8.59
Dexamethasone acetate	88.5	8.9	0.01	8.27
Betamethasone valerate	98.2	3.5	0.01	10.5
Betamethasone acetate	86.1	10.9	0.01	9.47
Fluocinonide	96.9	10.9	0.01	10.2
Betamethasone dipropionate	69.2	4.8	0.02	9.3
Clobetasol propionate	65.3	7.5	0.02	9.19
Tenoxicam	114	6.1	0.01	6.51
Indoprofen	98.5	4.2	0.01	8.29
Salsalate	86.9	8.9	0.01	8.75
Ketoprofen	91.9	4.6	0.01	9.04
Meloxicam	116.3	3.5	0.01	9.45
Flunixin	98.5	4.9	0.01	9.33
Diclofenac	116.2	13.3	0.01	10.43
Piroxicam	94.4	7	0.01	8.21
Sulindac	97.6	0.8	0.01	8.37
Tolmetin	95.7	6.6	0.01	8.73
Indomethacin	118.8	19	0.01	10.4
Ketoprofen	93.1	11.8	0.02	7.43
Tolfenamic acid	116.5	13.3	0.02	9.32
Meclofenamic acid	95.75	9.7	0.02	9.04
Sulfadiazine	82.7	15.6	0.02	4.54
Sulfathiazole	84.7	4.2	0.02	4.79
Sulfapyridine	86.1	6.6	0.02	4.78
Sulfamerazine	92.9	10.5	0.02	5.04
Sulfamethazine	76.4	3.6	0.02	5.42
Sulfamonomethoxine	75.3	5.4	0.02	5.65
Sulfamethizole	79.4	1	0.02	5.62
Sulfamer	82.1	3.4	0.02	5.66
Sulfachloropyridazine	72.5	1.8	0.02	6.36
Sulfamethoxy-pyridazine	81.3	0.7	0.02	5.66
Sulfadoxine	75	1.8	0.02	7.43
Sulfafurazole	74.7	1.4	0.02	7.43
Sulfamethoxazole	77.4	1	0.02	6.69
Sulfamethizole	74.7	2.3	0.02	6.93
Sulfabenzamide	71.1	1.7	0.02	7.33
Sulfaquinoxaline	70.4	6.7	0.02	7.42
Sulfacetamide	84.5	9	0.02	4.23
Sulfaphenazole	68.1	5	0.02	7.56
Sulfamidine	87.8	0.2	0.02	0.9
Sulfisomidine	93.4	3.2	0.02	2.85
Sulfadoxine	91.8	0.4	0.02	5.07
Sulfantran	89.7	2.8	0.02	7.17
Hydroxymetronidazole	98.5	11.6	0.01	2.8
Metronidazole	100.4	6.6	0.01	3.7
Dimetridazole	90.7	7.2	0.01	3.94
Ronidazole	103.5	9.2	0.01	4.22
Chlormethiazole	94.6	12.4	0.01	4.95
Nitrobenzimidazole	96	8.2	0.01	4.7

Analyte	Average Recovery Rate (%)	RSD/%	Spiking Level (mg/kg)	Retention Time (min)
Iprenidazole	82.9	2.7	0.01	6.52
Albendazole sulfoxide	101.5	5.7	0.01	5.11
Flubendazole	98.2	6	0.01	7.65
Oxfendazole	101.5	7.3	0.01	6.11
Mebendazole	102.7	6.1	0.01	7.29
Thiabendazole	98.5	6.6	0.01	4.23
Tinidazole	101.4	7.2	0.01	5.1
Ornidazole	102.7	7.1	0.01	5.6
Ronidazole	108.5	1.4	0.02	2.55
Dimetridazole	92.8	12.1	0.02	2.11
Hydroxymethyl metronidazole	96.1	9.3	0.02	1.72
Enrofloxacin	74.7	6	0.02	4.64
Norfloxacin	65.7	6.2	0.02	4.44
Pefloxacin	98.1	5.5	0.02	4.44
Ciprofloxacin	78.4	15.2	0.02	4.49
Ofloxacin	87.3	10.3	0.02	4.44
Sarafloxacin	60.5	7.3	0.02	4.92
Lomefloxacin	75.1	17.5	0.02	4.54
Nalidixic acid	63.2	2.2	0.02	8.09
Oxolinic acid	60.9	2.6	0.02	8.37
Flumequine	61.9	1	0.02	8.33
Difloxacin	69.2	2.1	0.02	4.94
Sparfloxacin	73.1	8	0.02	4.94
Fleroxacin	72.1	3	0.02	4.4
Erythromycin	72.1	5.3	0.02	6.08
Clindamycin	71.1	4.6	0.02	5.27
Roxithromycin	66.3	3.1	0.02	6.81
Tilmicosin	102.6	13.2	0.02	5.35
Avermectin	103.5	1.4	0.02	9.87
Lincomycin Hydrochloride	106.5	0.5	0.02	2.31
Tylosin	95.7	0.3	0.02	6.06
Spiramycin	73.4	5.4	0.02	4.83
Leucomycin	98.9	1.2	0.02	6.65
Ceftiofur	71.1	2.2	0.02	6.68
Cefalexin	88.1	0.6	0.02	3.57
Cefapirin	68.6	7.4	0.02	2.44
Cefaclor	68.4	11	0.02	2.25
Cefradine	95.7	8.7	0.02	3.78
Cefazolin	114.5	1.3	0.02	4.51
Cefotaxime	109	0.1	0.02	4.07
Tetracycline	85.8	8.9	0.01	4.64
Oxytetracycline hydrochloride	65.8	18.9	0.01	4.47
Chlortetracycline	92.7	3.6	0.01	4.47
Doxycycline	96.1	11.2	0.01	4.92
Clopidol	74.7	19.5	0.01	4.42
Amantadine	78	12.3	0.01	4.38
Chloramphenicol	100.2	13.3	0.01	6.69
Thiamphenicol	116.1	13.9	0.01	5.11
Florfenicol	95.3	14.5	0.01	6.49

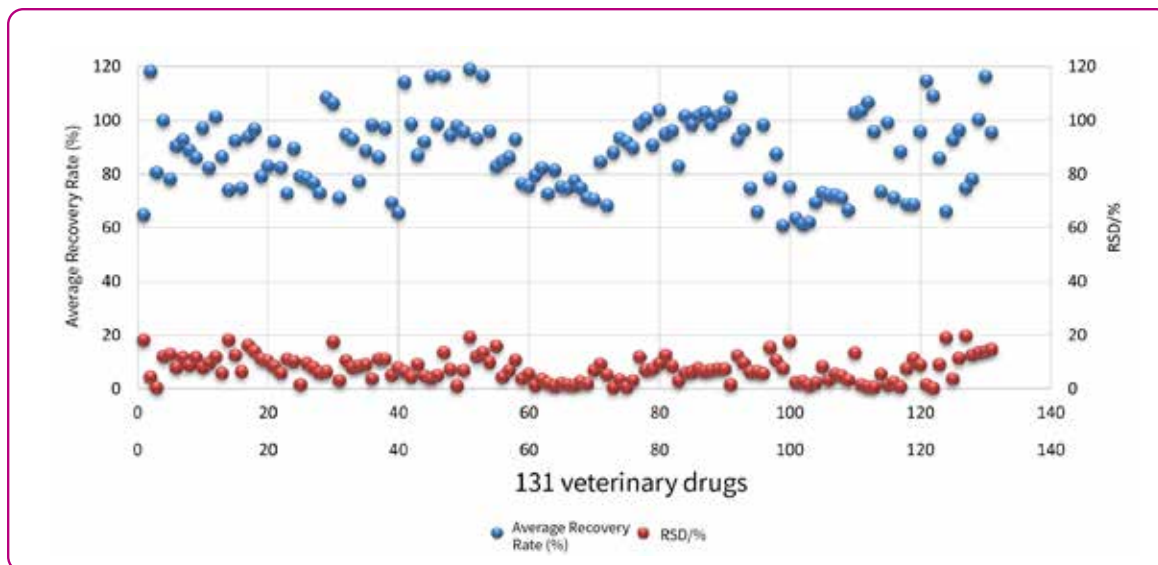
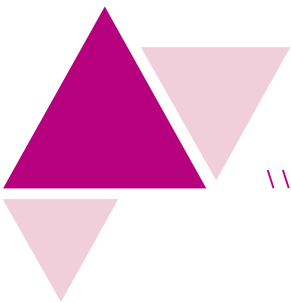


Figure 6. Recovery Rate and RSD Results of the Analysis Method for 131 Veterinary Drug Residues in Chicken

Conclusion

This experiment established a sample preparation method for 131 veterinary drug residues in chicken. Samples were then analyzed using LC-MS/MS. Results showed that the spiked recovery rate for chicken samples at 0.01 mg/kg and 0.02 mg/kg is between 60% and 120%, meeting the detection requirements. This indicates that the method is suitable for the simultaneous detection of 131 veterinary drug residues in chicken.

Note: For complete experimental reports and data, please contact your local sales representative.

Application: Analysis Method for Determining 66 Veterinary Drug Residues in Milk and Eggs

This study established a sample preparation method for analyzing 66 veterinary drug residues in milk and eggs using QuEChERS extraction followed by high-performance liquid chromatography-tandem mass spectrometry (LC-MS/MS). The samples were extracted with acetonitrile, purified using Cleanert LipoNo, detected by LC-MS/MS, separated with Kinetex F5, and quantified by the external standard method. The results demonstrated satisfactory recoveries ranging from 60% to 120% for all 66 veterinary drugs, with RSD below 15%, meeting the required detection criteria.

Sample Extraction

Weigh 2.5 g of the homogenized sample into a 50 mL centrifuge tube. Add 3 glass homogenization beads followed by 50 μ L of the mixed standard solution. Vortex for 1 minute. Then, add 8 mL of acetonitrile, shake for 1 minute, and sonicate for 15 minutes. Centrifuge the mixture at 8000 rpm for 5 minutes. The resulting supernatant is then ready for purification.

Sample Purification

Take 3 mL of supernatant and add it to Cleanert LipoNo purification tube (Cat. No.: MS-LN0415), shake for 1 min, let it stand for 1 min, then take 0.4 mL of supernatant, add 0.8 mL of water (the dilution factor can be determined according to the experimental conditions), mix well, and pass it through a 0.45 μ m PTFE syringe filter for LC-MS/MS analysis.

Experimental Results

As shown in Table 4, the QuEChERS method combined with liquid chromatography-tandem mass spectrometry was used to detect 66 veterinary drug residues in milk and eggs, with spiked recovery rates ranging from 60% to 120%, which meets the detection requirements. As illustrated in the figure, the use of a Kinetex F5 chromatographic column for the detection of multiple veterinary drug residues results in good peak shapes and stable retention times.

Table 4. Spiked Recovery Results for 66 Veterinary Drug Residues (Spiking Level: 0.2 mg/kg)

Analyte	Milk Matrix		Egg Matrix	
	Average Recovery Rate (%)	RSD/%	Average Recovery Rate (%)	RSD/%
Cefalexin	64.52	0.31	63.37	1.36
Cefapirin	73.41	8.38	77.3	6.93
Cefaclor	60.39	3.52	60.08	2.5
Cefradine	59.96	1.33	60.82	3.89
Cefetamet pivoxil	81.51	9.11	78.1	2.34
Cefazolin	73.68	4.83	70.53	7.35
Cefamandole lithium	90.55	8.1	79.22	6.8
Cefoperazone	73.83	9.32	67.15	5.25
Ceftiofur	78.64	4.46	66.1	7.4
Cefotaxime	74.85	3.83	64.4	2.58
Cefalonium	71.79	6.05	60.53	5.58
4-Nitroimidazole	82.51	5.53	76.61	4.21
Ipnidazole	85.33	14.13	70.44	8.38
2-Methyl-5-nitroimidazole	82.39	7.45	79.88	4.98
Ronidazole	94.03	12.55	70.83	6.7
Metronidazole	83.76	8.56	81.9	3.85
Chlormethiazole	75.78	2.15	61.21	1.2
Sulfamethazine (SIM)	115.9	3.13	117.25	6.8
Sulfacetamide (SAA)	87.72	2.08	76.01	5.9
Sulfadiazine (SDZ)	116.8	1.37	112.97	4.72
Sulfapyridine (SPD)	119.55	3.82	119.71	2.95
Sulfathiazole (STZ)	116.23	3.85	120.32	0.69
Sulfamerazine (SMR)	119.62	0.39	113.24	12.27
Sulfisoxazole (SMO)	117.54	3.11	119.41	1.72
Sulfadimidine (SDM)	118.81	2.8	115.25	4.9
Sulfamethoxypyridazine (SMP)	119.07	2.7	118.37	0.55
Sulfamethizole (SMT)	120.32	1.05	118.1	2.19
Sulfadimethoxine (SMD)	117.59	2.83	120.37	0.28
Sulfamethoxypyrimidine (SMM)	119.38	1.1	120.41	0.44
Sulfachloropyridazine (SCP)	118.04	0.09	98.79	7.16
Sulfadoxine (SDX)	117.33	2.62	114.28	7.47
Sulfamethoxazole (SMZ)	101.29	7	86.7	5.62
Sulfisoxazole (SFZ)	117.81	5.11	80.81	3.43
Dimetridazole	83.26	3.98	74.87	1.9
Benznidazole	95.4	0.85	75.37	1.12
Hydroxymetronidazole	78.74	3.69	78.89	2.9
Hydroxymethyl metronidazole	91.02	0.41	80.8	4.46

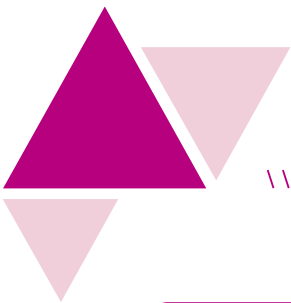


Table 4. Spiked Recovery Results for 66 Veterinary Drug Residues (Spiking Level: 0.2 Mg/Kg) (Continued)

Analyte	Milk Matrix		Egg Matrix	
	Average Recovery Rate (%)	RSD/%	Average Recovery Rate (%)	RSD/%
Ivermectin	64.62	2.22	60.03	2.1
Erythromycin	108.42	7.59	72.44	5.07
Lincomycin Hydrochloride	91.85	4.32	102.14	4.96
Clindamycin hydrochloride	94.47	4.35	72.61	4.02
Tilmicosin	82.19	4	66.86	1.26
Tylosin	84.9	0.82	66.42	8.4
Spiramycin	91.21	11.74	73.5	14.53
Leucomycin	92.25	4.57	61.27	2.68
Eprinomectin	82.21	0.86	69.21	5.07
Doramectin	60.38	8.73	62.78	2.39
Virginiamycin M1	100.67	9.48	70.98	3.65
Sulfadiazine (SGN)	89.77	4.34	74.61	2.52
Trimethoprim (TMP)	115.7	2.8	114.43	2.78
Sulfabenzamide (SBA)	92.57	5.46	83.53	3.19
Sulfadimethoxine (SDT)	116.2	2.05	115.41	6.35

Analyte	Milk Matrix		Egg Matrix	
	Average Recovery Rate (%)	RSD/%	Average Recovery Rate (%)	RSD/%
Sulfaquinoxaline (SQX)	114.56	4.06	103.48	10.74
Sulfapyrazole (SPA)	110.07	4.06	99.74	7.17
Sulfanilamide nitrobenzene (SAN)	96.39	12.91	69.03	6.26
Oxolinic acid	104.57	2.16	87.06	9.17
Sarafloxacin hydrochloride	60.94	14.59	61.39	0.91
Flumequine	88.23	6.08	68.08	10.39
Enrofloxacin	87.35	3.57	77.38	0.15
Danofloxacin	77.26	12.33	64.7	1.06
Difloxacin hydrochloride	73.97	4.65	61.15	2.34
Ciprofloxacin	60.81	3.91	61.74	2.06
Lomefloxacin hydrochloride	74.08	1.07	62.45	1.69
Norfloxacin	68.93	5.32	61.86	1.59
Pefloxacin mesilate	87.84	6.99	66.49	10.31
Ofloxacin	83.49	6.24	63.46	1.24

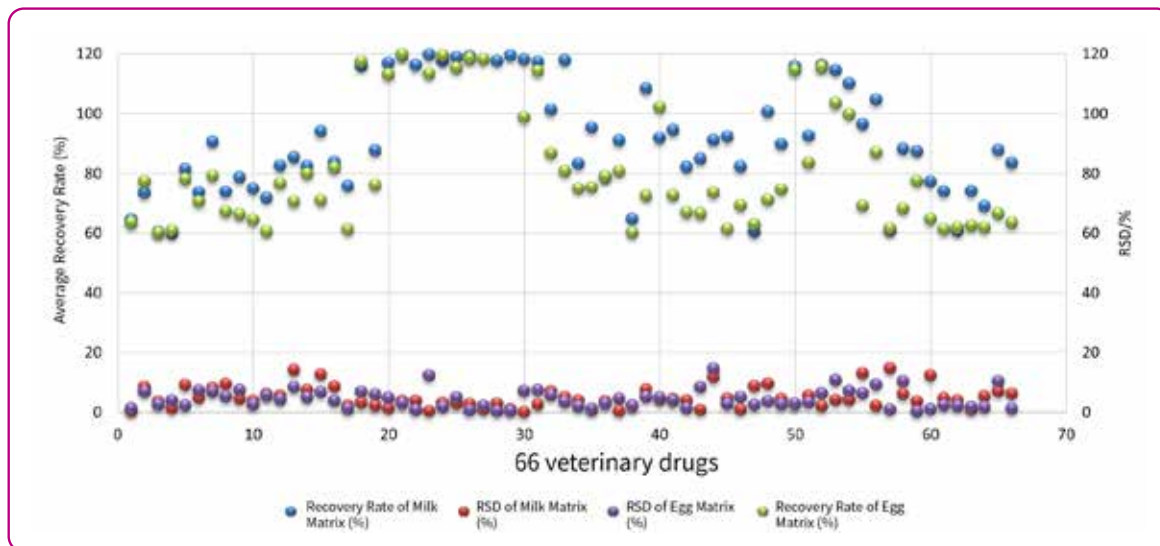


Figure 7. Recovery Rates and RSD Results for the Analysis Method of 66 Veterinary Drug Residues in Milk and Eggs

Conclusion

In this experiment, a sample preparation method for 66 veterinary drug residues in milk and eggs was established, and the samples were analyzed using LC-MS/MS. The results indicated that the spiked recovery rates for the 66 veterinary drug residues in milk and eggs ranged from 60% to 120%, with RSD below 15%, demonstrating good parallelism and meeting the experimental requirements. This suggests that the method is suitable for the simultaneous detection of 66 veterinary drug residues in milk and eggs.

Note: For complete experimental reports and data, please contact your local sales representative.

Cleanert PBA Dedicated Column for Ribavirin

Description

Ribavirin, a synthetic broad-spectrum antiviral drug, is widely used to treat human viral diseases. However, some illegal breeders add it to livestock and poultry feed to prevent disease outbreaks. This practice is problematic because ribavirin residues not only alter the flavor of food but also accumulate in the human body, leading to neurotoxicity. This accumulation can ultimately impair human health and compromise the body's ability to fight off viruses.

Cleanert PBA, referencing the principles outlined in "SN/T 4519-2016 Determination of Ribavirin Residue in Animal-derived Foods for Export - Liquid Chromatography-Tandem Mass Spectrometry," offers optimized operating conditions to help you detect ribavirin in chicken quickly and efficiently.

Operating Process

Sample Extraction

Accurately weigh 2 g of a homogenized chicken sample and place it into a 15 mL centrifuge tube. Sequentially add the ribavirin standard solution, ribavirin-¹³C5 internal standard, and 5 mL of ammonium acetate solution (pH 4.8). Then, add 10 mg of acid phosphatase (0.5-3.0 unit/mg solid) to the centrifuge tube. Vortex for 30 seconds and enzymatically hydrolyze at 37 ° C for 2 hours in the dark. Add 4 mL of 5% trichloroacetic acid aqueous solution to the enzymatic hydrolysate, vortex for 30 seconds, and centrifuge at 10,000 rpm for 10 minutes at a low temperature (3-4° C). Adjust the pH of the supernatant to 8.5 ± 0.1 with ammonia water. Pass it through a 0.45 µm MCE syringe filter (Cat. No.: AS011345-19) and dilute to 10 mL with water for purification.

Sample Purification

Cartridge: Cleanert PBA (100 mg/3 mL)
Cat. No.: PBA1003
Activation: 3 mL of acetonitrile, 1 mL of 100 mM formic acid aqueous solution, 3 mL of pH 8.5 ammonium acetate
Sample Loading: 5 mL of solution to be purified
Washing: 3 mL of pH 8.5 ammonium acetate, 3 mL of water, drain
Elution: 2 mL of 100 mM formic acid aqueous solution, collect, and pass through a 0.22 µm Nylon syringe filter (Cat. No. AS021320-19) for measurement.

Experimental Results

LC Conditions

Column: Venusil MP C18(2), 3 µm, 110 Å
Specifications: 150 x 2.1mm
Cat. No.: VA931502-2
Mobile Phase: A: 0.1% FA aqueous solution
 B: Acetonitrile

Gradient:: Time (min)	B (%)
0.00	5
2.00	15
5.50	15
5.51	5
9.00	5

Flow Rate: 0.4 mL/min

MS Conditions

Instrument Model: SCIEX Liquid Chromatography-Tandem Mass Spectrometry
Ion Source: Electrospray Ionization Source
Scanning Mode: Positive Ion Mode
Electrospray Voltage: 5000 V
Air curtain pressure: 15 psi
Auxiliary air pressure: 40 psi
Nebulizer air pressure: 40 psi
Ion source temperature: 400 °C
Acquisition mode: Multiple reaction monitoring (MRM)

Table 1. Mass Spectrometry Parameters of Ribavirin

Compound	Q1	Q2	DP	CE
Ribavirin	245.2	113.0*	53	15
	245.2	96.2	53	44
Ribavirin- ¹³ C ₅	250.1	113.0*	54	14
	250.1	96.3	53	42

Note: "*" denotes the quantitative ion pair.

Table 2. Recovery Test Results of Cleanert PBA (100 mg/3 mL).

Chicken Spiking Level (5 ng/g)	Recovery Efficiency (Internal Standard Correction)
Ribavirin Parallel 1	109.9%
Ribavirin Parallel 2	109.8%

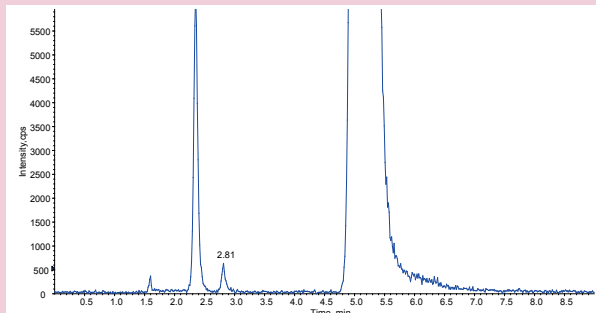


Figure 1. XIC Diagram of Ribavirin (Retention Time: 2.81 min) in the Eluate Collected from Spiked Chicken Samples (5 ng/g)

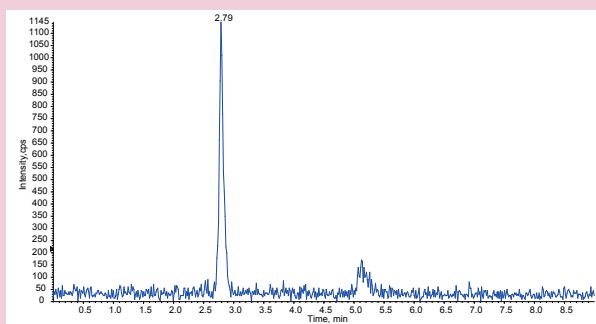


Figure 2. XIC Diagram of the Ribavirin Standard Solution (Retention Time: 2.79 min).

Ordering Information

Product Name	Type	Unit	Part Number
Cleanert PBA Dedicated Column for Ribavirin	SPE Cartridge	100 mg/1 mL (100/Pk)	PBA1001
		100 mg/3 mL (50/Pk)	PBA1003
		500 mg/6 mL (30/Pk)	PBA5006
	Sorbent	10 g/bottle	PBA0010



Cleanert MC Dedicated Column for Mycotoxin Detection

A dedicated column specially developed for detecting mycotoxins in food and feed!

Description

- ✓ More Efficient: Simultaneously purifies dozens of mycotoxins, significantly improving experimental efficiency.
- ✓ More Accurate: Quantitative analysis is more accurate using the LC-MS/MS detection method.
- ✓ Safer: Reduces exposure time to mycotoxins, greatly minimizing chemical hazards.

The Cleanert MC dedicated column for mycotoxin detection is packed with multiple materials in a specific ratio, enabling the simultaneous detection of dozens of mycotoxins. This product offers simple operation, requiring no activation, elution, or rinsing steps. Purification is achieved through a single filtration step, allowing for more accurate quantification using the LC-MS/MS method.



Method Comparison	Immunoaffinity Chromatography Column	Cleanert MC Dedicated Column for Mycotoxin Detection
Versatility	Weak: Only one or one type of mycotoxin can be detected at a time.	Strong: Dozens of mycotoxins can be detected simultaneously.
Operability	Poor: When a sample contains multiple types of mycotoxins, different immunoaffinity columns are required for multiple tests, resulting in a cumbersome process.	Strong: simple operation, no activation, elution, or rinsing steps are required, achieving purification with a single filtration.
Safety	Lengthy experimental procedures increase the risk of laboratory personnel exposure to mycotoxins, posing a serious health hazard.	Short operation times minimize the risk to laboratory personnel.

Ordering Information

Product Name	Type	Unit	Part Number
Cleanert MC	IC Cartridge	1 mL IC Ion Cartridge (50/Pk)	IC-MYT10-B



Application: Simultaneous Determination of 25 Mycotoxins in Feed Ingredients Using Liquid Chromatography-Tandem Mass Spectrometry

Weigh 5.0 g of the sample accurately into a
50 mL plastic centrifuge tube

Add 20 mL of the extraction solution
(Acetonitrile:water:formic acid = 84:15.9:0.1, V/V/V)

Vortex oscillate at 2500 rpm for 10 minutes (or
sonicate for 30 minutes), then centrifuge at 8000
rpm for 5 minutes.

Take 600 µL of supernatant with a 1 mL needleless
syringe, connect a Cleanert MC column and a 0.22
µm nylon syringe filter at the outlet of the syringe,
push the syringe plunger to collect the effluent
into a conical-bottom vial for LC-MS/MS analysis.

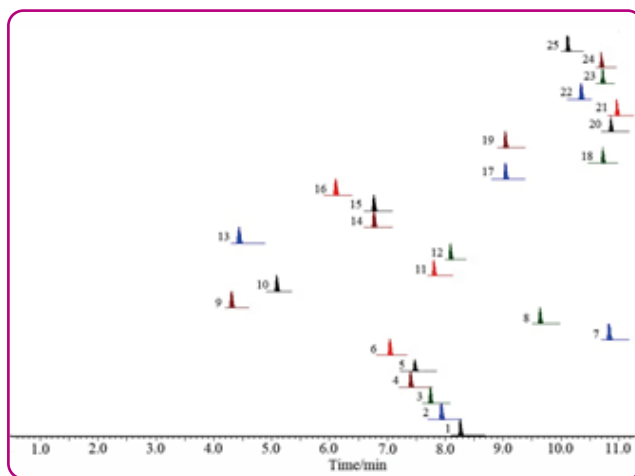


Figure 1: Quantitative Ion Chromatogram of Blank Corn Feed Matrix-Matched Standard Solutions (concentrations from 1 to 12 are 10 ng/g, and from 13 to 25 are 50 ng/g)

Table 1: The spiked recovery and precision tests showed that the average recovery rate was between 70% and 120%, and the relative standard deviation (RSD) was less than 20%.

Serial Number	Analyte	Molecular Formula	CAS No.	Retention Time
1	Aflatoxin B1 (AFB1)	C ₁₇ H ₁₂ O ₆	1162-65-8	8.27
2	Aflatoxin B2 (AFB2)	C ₁₇ H ₁₄ O ₆	7220-81-7	7.95
3	Aflatoxin G1 (AFG1)	C ₁₇ H ₁₂ O ₇	1165-39-5	7.75
4	Aflatoxin G2 (AFG2)	C ₁₇ H ₁₄ O ₇	7241-98-7	7.41
5	Aflatoxin M1 (AFM1)	C ₁₇ H ₁₂ O ₇	6795-23-9	7.48
6	Aflatoxin M2 (AFM2)	C ₁₇ H ₁₄ O ₇	6885-57-0	7.05
7	Sterigmatocystin (STE)	C ₁₈ H ₁₂ O ₆	10048-13-2	10.85
8	T-2 Toxin (T-2)	C ₂₄ H ₃₄ O ₉	21259-20-1	9.65
9	Lysergol (LYS)	C ₁₆ H ₁₈ N ₂ O	602-85-7	4.34
10	Methylephedrine (MET)	C ₂₀ H ₂₅ N ₃ O ₂	113-42-8	5.10
11	Roquefortine C (RC)	C ₂₂ H ₂₃ N ₅ O ₂	58735-64-1	7.82
12	Diacetoxyscirpenol (DIA)	C ₁₉ H ₂₆ O ₇	2270-40-8	8.10
13	Deoxynivalenol (DON)	C ₁₅ H ₂₀ O ₆	51481-10-8	4.46
14	3-Acetyldeoxynivalenol (3-AcDON)	C ₁₇ H ₂₂ O ₇	50722-38-8	6.78

Serial Number	Analyte	Molecular Formula	CAS No.	Retention Time
15	15-Acetyldeoxynivalenol (15-AcDON)	C ₁₇ H ₂₂ O ₇	88337-96-6	6.78
16	Neosolaniol (NEO)	C ₁₉ H ₂₆ O ₈	36519-25-2	6.11
17	Wortmannin (WOR)	C ₂₃ H ₂₄ O ₈	19545-26-7	9.05
18	Verruculogen (VER)	C ₂₇ H ₃₃ N ₃ O ₇	12771-72-1	10.73
19	HT-2 toxin (HT-2)	C ₂₂ H ₃₂ O ₈	26934-87-2	9.05
20	Zearalenone (ZEN)	C ₁₈ H ₂₂ O ₅	17924-92-4	10.90
21	α-Zearalenol (α-ZEL)	C ₁₈ H ₂₄ O ₅	6455-72-8	10.75
22	β-Zearalenol (β-ZEL)	C ₁₈ H ₂₄ O ₅	71030-11-0	10.98
23	Zearalanone (ZAN)	C ₁₈ H ₂₄ O ₅	5975-78-0	10.36
24	α-Zearalanol (α-ZAL)	C ₁₈ H ₂₆ O ₅	26538-44-3	10.72
25	β-Zearalanol (β-ZAL)	C ₁₈ H ₂₆ O ₅	42422-68-4	10.13



Dedicated Columns for Pesticide Residue Analysis

Cleanert Dual-Layer Column Series

Cleanert PestiCarb/NH₂

Cleanert PestiCarb/NH₂ column is packed with equal amounts of graphitized carbon (PestiCarb) and amino groups (NH₂) sorbent. Graphitised carbon is treated with a special surface treatment, which has a strong adsorption capacity for planar molecules, such as chlorophyll and carotene in fruits and vegetables; NH₂ is an aminopropyl-bonded silica, which is used for the removal of fatty acids, organic acids, and other interfering substances; the solid-phase extraction columns have been widely used in the analysis of pesticide residues and in the detection of a wide range of pesticide residues in the Japan Positive List System, and also used in GB 23200.8-2016 National Standard for Food Safety, the Determination of 500 Pesticide and Related Chemical Residues in Fruits and Vegetables.

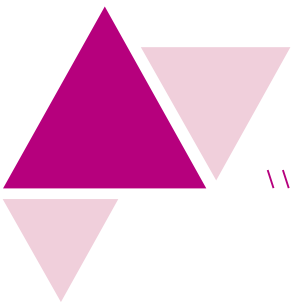


Cleanert PestiCarb/PSA

Cleanert PestiCarb/PSA column is packed with equal amounts of PestiCarb graphitized carbon (upper layer) and PSA (lower layer) sorbent, separated by a polyethylene frit in between. Graphitised carbon is treated with a special surface treatment, which has a strong adsorption capacity for planar molecules, such as chlorophyll and carotene in fruits and vegetables; PSA is N-propyl ethylenediamine bonded silica used to remove fatty acids, organic acids, and some polar pigments and sugars that can interfere with analysis; compared with NH₂, it has both primary and secondary amines, and has a stronger effect on the removal of fatty acids. It is also used for the purification of fat-rich samples such as animal tissues, milk and eggs in the Positive List System of Japan.

Cleanert SAX/PSA

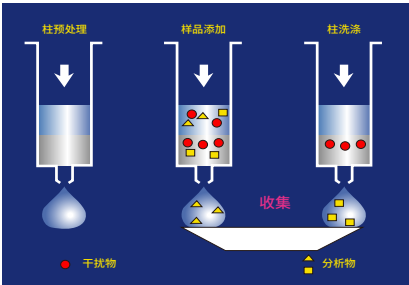
Cleanert SAX/PSA column is packed with equal amounts of SAX (upper layer) and PSA (lower layer) sorbent, separated by a polyethylene frit in between. SAX is a quaternary ammonium salt-bonded silica, while PSA is an N-propylethylenediamine-bonded silica. Both materials are designed for the removal of acidic interferents such as fatty acids and organic acids. They are utilized in the Luke and Luke11 methods, significantly reducing matrix effects and enhancing detection sensitivity in GC/MS analysis of pesticides in food.



Usage Method of Dual-Layer Purification Column

For multi-residue pesticide detection, it is quite challenging to select a single material that can adsorb all pesticides and then elute them. Therefore, dual-layer columns utilize two sets of materials that work in conjunction to remove interferents from the matrix without retaining the pesticide analytes.

As illustrated, after activating and conditioning the SPE cartridge, add the sample immediately as the activation solution is about to run dry. Once the sample is loaded, add an appropriate amount of eluent. Concentrate the eluent to near dryness, reconstitute, filter, and prepare for injection.



Ordering Information

Product Name	Type	Unit	Part Number
Cleanert PestiCarb/NH ₂	Cartridge	200 mg/200 mg/3 mL (50/Pk)	PN4003
		250 mg/250 mg/3 mL (50/Pk)	PN5003
		250 mg/250 mg/6 mL (30/Pk)	PN5006
		300 mg/500 mg/6 mL (30/Pk)	PN8006
		500 mg/500 mg/6 mL (30/Pk)	PN0006
		500 mg/1g/12 mL (20/Pk)	PN150012
Cleanert PestiCarb/PSA	Cartridge	500 mg/200 mg/6 mL (30/Pk)	PP7006
		250 mg/500 mg/6 mL (30/Pk)	PP7506
		300 mg/500 mg/6 mL (30/Pk)	PP8006
		500 mg/500 mg/6 mL (30/Pk)	PP0006
		500 mg/1 g/6 mL (30/Pk)	PP15006
Cleanert SAX/PSA	Cartridge	500 mg/500 mg/6 mL (30/Pk)	SP0006

Cleanert Triple Phase Mixed Purification Column Series



Cleanert TPT (Triple Phase SPE for Tea)

Description

Cleanert TPT column is packed with three types of sorbent in a layered manner according to a specific ratio. Its primary function is to remove pigments, volatile organic acids, tea polyphenols, and other impurities from tea without adsorbing the target pesticides. This ensures both effective sample purification and a high recovery rate of the target compounds.

This method has been incorporated into the following national standards: "GB/T 23204-2008 Determination of 519 Pesticide and Related Chemical Residues in Tea - Gas Chromatography-Mass Spectrometry" and "GB 23200.13-2016 Determination of 448 Pesticide and Related Chemical Residues in Tea - Liquid Chromatography-Tandem Mass Spectrometry." This method has been recommended as an official method by AOAC in AOAC 2014.09 for the simultaneous detection of 653 multi-residue pesticides.

Features

- Packed with three sorbent, the column adsorbs impurities at multiple sites. The ratio of sorbent has been optimized.
- Suitable for removing complex matrix effects without causing irreversible adsorption of pesticides.
- The method is user-friendly, widely applicable, and enables the simultaneous detection of multiple pesticide residues in complex matrices.

Operating Process

5 g of Tea Sample (GC/MS & LC-MS/MS)

Homogenize with 15 mL of acetonitrile, centrifuge, repeat the extraction once, combine both extracts, and evaporate to 1 mL at 40° C. Prepare for purification.

Add 2 cm of anhydrous sodium sulfate on top of a Cleanert TPT tea pesticide residue purification column. Pass the sample solution through the column.

Elute with 25 mL of toluene:acetonitrile (1:3) eluent.

Bring to a constant volume with n-hexane.

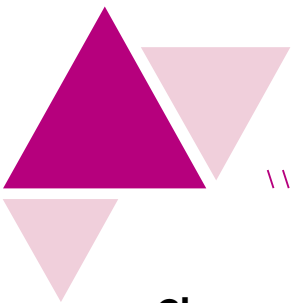
Detection of 519 Pesticides in Tea Using GC/MS

Bring to a constant volume with acetonitrile:water (3:2)

Detection of 448 Pesticides in Tea Using LC-MS/MS

Ordering Information

Product Name	Type	Unit	Part Number
Cleanert TPT (Dedicated Extraction Column for Tea)	Cartridge	1 g/6 mL (30/Pk)	TPT0006
		2 g/10 mL (20/Pk)	TPT200010



Cleanert TPH (Triple Phase SPE for Herb)

Description

Cleanert TPH column is packed with three types of sorbent in a layered manner according to a specific ratio. It is used to remove pigments, acidic interfering impurities, sugars and ester-soluble impurities in Chinese herbal medicines without adsorbing target pesticides.

This method has been applied to the following national standard methods: GB 23200.10-2016, "Determination of 488 Pesticide and Related Chemical Residues in Mulberry Branches, Honeysuckle, Goji Berries, and Lotus Leaves by Gas Chromatography-Mass Spectrometry," and GB 23200.11-2016, "Determination of 413 Pesticide and Related Chemical Residues in Mulberry Branches, Honeysuckle, Goji Berries, and Lotus Leaves by Liquid Chromatography-Tandem Mass Spectrometry."

GC/MS detection method				
	2.5 g sample of mulberry branches	2.5 g sample of lotus leaves	5 g sample of honeysuckle	5 g sample of goji berries
	Add 2 g of NaCl and 15 mL of acetonitrile to the sample. Homogenize and extract twice at high speed. After centrifuging at high speed, collect the supernatant. Combine the extracts and concentrate to 1 mL below 40° C.			First, soak the sample in 5mL of water. The remaining steps are identical to those for other samples.
	Cleanert TPH Dedicated Column for Detection of Pesticide Residues in Chinese Herbal Medicines			
LC-MS/MS	The solution of n-hexane: acetone (4:6) was eluted with 25 mL, concentrated by rotary evaporation to dryness, redissolved in n-hexane, added internal standard, pass through a syringe filter and ready for analysis.			
	2 g sample of mulberry branches	2 g sample of lotus leaves	2 g sample of honeysuckle	2 g sample of goji berries
	Add 2 g of NaCl and 15 mL of acetonitrile to the sample. Homogenize and extract twice at high speed. After centrifuging at high speed, collect the supernatant. Combine the extracts and concentrate to 1 mL below 40° C.			First, soak the sample in 5mL of water. The remaining steps are identical to those for other samples.
	Elute the sample with 25 mL of a 3:1 acetonitrile:toluene solution. Concentrate the eluate to near dryness by rotary evaporation, then blow dry with nitrogen. Reconstitute the sample in 1 mL of a 3:1 acetonitrile:toluene solution, pass through a syringe filter and ready for analysis.			

Ordering Information

Product Name	Type	Unit	Part Number
Cleanert TPH (Dedicated Extraction Column for Chinese Herbal Medicine)	Cartridge	1 g/6 mL (30/Pk)	TPH0006
		2 g/10 mL (20/Pk)	TPH200010

Cleanert NANO Carbon Nanomaterial Purification Products

Description

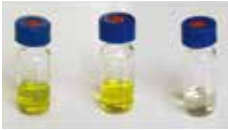
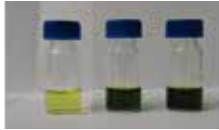
The surface of the material has been functionalized and bonded with special functional groups, which greatly increases the selectivity for interferences such as pigments and fatty acids. Through surface deactivation technology, the excessive adsorption of the material to drugs is controlled, ensuring the recovery rate of sensitive pesticides. This material has a large specific surface area and a typical layered hollow structure, which increases its specific surface area and the material's loading capacity.

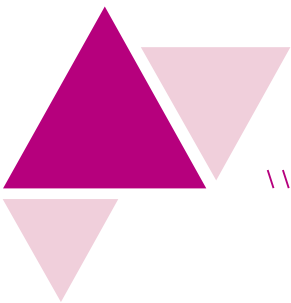


Features

- Fast: one-step centrifugation or filtration instead of SPE cartridge process, saving one-third of the processing time.
- Clean: High specificity, with 3-10 times the interference removal ability of traditional purification materials.
- Accurate: Recovery rate of 70-120%, RSD < 10%.
- Economical: Requires only 1/10~1/5 the dosage of traditional purification materials, reducing costs.

Product Selection Recommendations

 Samples of Common Fruit and Vegetable	 Samples of Tea with High-Pigment and Complex Matrix
IC Filter Type: IC-NN1010-V Centrifuge Tube Type: MS-NANO-V	IC Filter Type: IC-NN1510-C Centrifuge Tube Type: MS-NANO-C
 Purification Effect Comparison of Cabbage Samples In order: unpurified samples; samples purified with PSA; samples purified with IC-NANO-V column	 Purification Effect Comparison of Tea Sample In order: samples purified with the IC-NANO-C column; samples purified with PSA; unpurified samples.



Operating Method

Centrifuge Tube Operation

10 g sample + 10 mL acetonitrile



Vortex and centrifuge

Add 4 g MgSO_4 and 1 g NaCl (MS-MG5055)



Vortex and centrifuge

Take 1 mL of the supernatant and add it to the Cleanert MS-NANO-V Purification Tube for Agricultural Products



Vortex and centrifuge

Transfer the supernatant to a vial, add 10 μL of the internal standard substance, mix well, and inject into the GC-MS system

IC Filter Operation

10 g sample + 10 mL acetonitrile



Vortex and centrifuge

Add 4 g MgSO_4 and 1 g NaCl (MS-MG5055)



Vortex and centrifuge

Extract 1 mL of the extract into the Cleanert IC-NANO-V Purification Cartridge for Agricultural Products (IC-NN1010-V), then elute it, repeat the elution process 3-4 times



Filter the supernatant through a 0.22 μm organic syringe filter

Transfer to a vial and inject into the LC-MS system

Ordering Information

Product Name	Type	Unit	Part Number
Dedicated Purification Tubes for Agricultural Products	Centrifuge Tube	15 mL centrifuge tubes (50/Pk)	MS-NANO-V
Dedicated Purification Tubes for Complex Matrices	Centrifuge Tube	15 mL centrifuge tubes (50/Pk)	MS-NANO-C
Dedicated Purification Columns for Agricultural Products	IC Cartridge	1 mL IC Filter Cartridges (50/Pk)	IC-NN1010-V
Dedicated Purification Columns for Complex Matrices	IC Cartridge	1 mL IC Filter Cartridges (50/Pk)	IC-NN1510-C



Dedicated Columns for Food Detection

Cleanert BAP Dedicated Benzopyrene Column

Description

Cleanert BAP dedicated benzopyrene columns are suitable for purification method 1 outlined in the national standard GB 5009.27-2016. Based on the principle of chromatographic separation, these columns separate non-polar interfering substances from benzopyrene in oil, effectively removing matrix interferences during analysis. BAP2260-0, an upgraded product within the low-background series, offers controllable background levels in the ppb range, meeting the stringent testing requirements for export products.

The Cleanert BAP-3 dedicated benzopyrene columns, suitable for the GB 5009.27-2016 standard method (purification method 2), utilizes molecular imprinting to adsorb benzo(a)pyrene. This makes it particularly effective for extracting benzo(a)pyrene from oily samples. Compared with purification method 1, it offers superior oil removal effect, consistent benzo(a)pyrene recovery rate, reduced solvent use (for environmental friendliness), and a simplified procedure.



BAP Operation Process

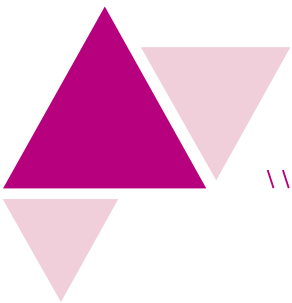
Activation: Activate with 30 mL of n-hexane.

Loading: Weigh 0.3 g of the oil sample, dilute it with 5 mL of n-hexane, and load the solution.

Elution: Elute with 80 mL of n-hexane.

Concentration and dilute to volume: Concentrate to near dryness, rinse the rotary evaporation flask with n-hexane, transfer the solution to a volumetric tube, adjust the volume to 300 μ L using nitrogen gas, and then transfer it to a vial with an insert for direct injection and analysis.

***Precautions:** Do not allow the column to dry out during the procedure. When the benzo(a)pyrene standard sample is dissolved in acetonitrile, it is immiscible with the eluent, resulting in low and unstable recovery. This problem can be solved by dissolving the standard sample in toluene.



BAP-3: Operation Process

Product Name: Cleanert BAP-3 (P/N: BAP5006)

(1) For peanut oil, soybean oil, corn oil, sunflower seed oil, rice oil, linseed oil, blended oil, rapeseed oil, and olive oil, the solid phase extraction method is as follows:

Activation: 5 mL of dichloromethane, 5 mL of n-hexane

Sample Loading: Dilute 0.5 g of the oil sample with 3 mL of n-hexane. Load the solution onto a Cleanert BAP-3 column. Rinse the sample bottle with 2 mL of n-hexane to ensure complete loading.

Washing: 10 mL of n-hexane

Elution: 5 mL of dichloromethane

Concentration: Dry the sample solution under nitrogen at 40° C. Adjust the volume with 1 mL of acetonitrile. Sonicate for 10 seconds and filter through a 0.22 µm PTFE syringe filter for testing.

(2) For sesame oil, a Cleanert Si silica solid phase extraction column (500 mg/6 mL) needs to be connected in series to the BAP-3 column. The activation and sample loading steps are the same as above. For washing step, first, wash the tandem column with 5 mL of n-hexane, then remove the silica column. Next, wash the Cleanert BAP-3 column again with 5 mL of n-hexane. Finally, elute and concentrate according to the method described above.

Method Comparison	Elution Solvent	Maximum Sample Loading Volume
BAP-3	5 mL of dichloromethane	0.5 g of oily sample
BAP	80 mL n-hexane	This method uses a 0.3 g oil sample and is not suitable for sesame oil.

Ordering Information

Product Name	Type	Unit	Part Number
Cleanert BAP Dedicated Benzopyrene Column	SPE Cartridge	22 g/60 mL (10/Pk)	BAP2260-0
Cleanert BAP-3 Dedicated Benzopyrene Column	SPE Cartridge	500 mg/6 mL (30/Pk)	BAP5006
Cleanert BAP-3 Dedicated Benzopyrene Column	SPE Cartridge	500 mg/6 mL (30/Pk) Glass Cartridges	BAP5006-G

Cleanert PAH MIP/Cleanert PAH-EU Column for Polycyclic Aromatic Hydrocarbon Detection

Cleanert PAH MIP

Polycyclic aromatic hydrocarbons (PAHs) are hydrocarbons containing more than two benzene rings in the molecule, including naphthalene, anthracene, phenanthrene, pyrene and more than 150 other compounds, of which a considerable portion is carcinogenic, such as benzo[a]pyrene and benzo[a]anthracene, making them important environmental and food pollutants. The Cleanert PAH MIP column developed by our company adopts the principle of molecular imprinting to adsorb PAHs, with good oil removal effect, suitable for the detection of PAHs in all kinds of oils and fats. The method is simple and time-efficient, with a high recovery rate and good parallelism.

Chromatographic Analysis

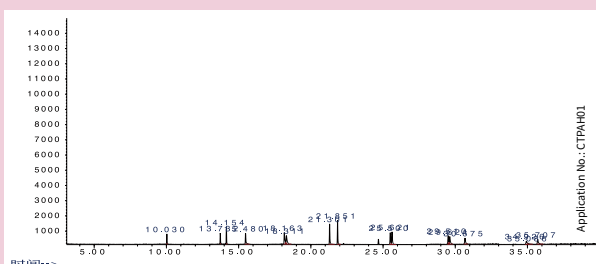


Figure 1. GC-MS Chromatogram of 16 PAHs Standard Solution

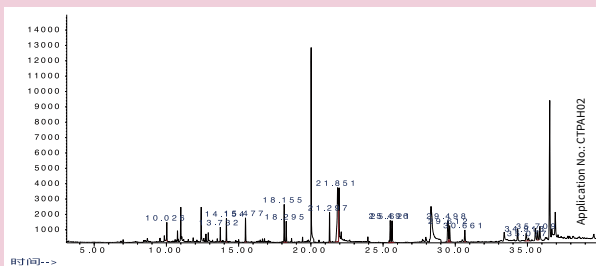


Figure 2. GC-MS Chromatogram of 16 PAHs Spiked in Vegetable Oil

Column: ZB-5MS Plus

Specifications: 30 m × 0.25 mm × 0.25 μm

Cat. No.: 7HG-G030-11

Injection: Unsplit injection at 280° C, 1 μL

Carrier gas: Helium, purity ≥ 99.999%, 1 mL/min

Heating procedure: Initial temperature: 45° C, hold for 1 min. Increase to 180° C at 10° C/min, hold for 1 min. Increase to 250° C at 10° C/min, hold for 2 min. Increase to 285° C at 5° C/min, hold for 2 min. Increase to 320° C at 10° C/min, hold for 1 min. Finally, increase to 345° C at 10° C/min.

Cleanert PAH-EU

To better meet national standard detection requirements, Agela Cleanert solid phase extraction columns (styrene divinylbenzene polymer) are suitable for the determination of polycyclic aromatic hydrocarbons in food according to the Chinese National Food Safety Standard GB 5009.265-2021, Method 1. We also offer the Phenomenex ZB-PAH-EU column, specifically designed to meet the new standard requirements. Agela and Phenomenex are committed to providing you with comprehensive solutions.

The new Cleanert PAH dedicated column has been thoroughly validated for various sample matrices and demonstrates good recovery, especially for complex matrices such as oil and milk powder.

If you need to validate the second method, high-performance liquid chromatography, in GB 5009.265-2021, we can provide a complete solution. This includes the QuEChERS kit and solid phase extraction products for sample preparation, and Venusil PAH dedicated chromatographic columns, to fully support the validation of the new national standard method.

Operating Procedure

Activation: 10 mL dichloromethane, 5 mL cyclohexane

Sample loading: Weigh 0.5 g of vegetable oil sample and dissolve it in 3 mL of cyclohexane.

Washing: Apply 4 mL of cyclohexane and drain the cartridge.

Elution: Elute with 10 mL dichloromethane, blow with nitrogen, dilute to 1 mL with dichloromethane, and perform GC-MS analysis.

Ordering Information

Product Name	Type	Unit	Part Number
Cleanert PAH MIP	SPE Cartridge	1 g/6 mL (20/Pk), Glass Cartridges	PAH0006-G



Cleanert PWAX Plus Dedicated Column for Synthetic Colorants

Description

Synthetic colorants are indispensable additives in various processed foods. Common synthetic colorants found in food include Tartrazine, New Red, Amaranth, Indigo Carmine, Carmines, Sunset Yellow, Allura Red, Brilliant Blue, Acid Red, and Erythrosine.

The detection of synthetic colorants in food is often plagued by issues such as multiple target compounds, complex sample matrices, and large sample volumes. In response to these challenges, Agela-Phenomenex has newly upgraded the Cleanert PWAX Plus dedicated column for synthetic colorants, which can simultaneously extract 11 types of synthetic colorants from various food matrices. For red pigments in food that are difficult to purify and enrich, especially carmine and erythrosine, the performance of the sorbent has been optimized and enhanced.

This column selectively adsorbs synthetic colorants in food and utilizes ammoniated methanol for elution, resulting in short concentration times. It is suitable for use in accordance with the national food safety standard "Determination of Synthetic Colorants in Foods" (GB 5009.35-2023). This method is widely employed in food detection, particularly for large sample batches.

Erythrosine, with a sodium benzoate structure, exhibits weaker retention on SPE cartridges compared with other colorants with a sodium benzenesulfonate structure. Therefore, when testing samples containing erythrosine, it is necessary to optimize the washing conditions. The final washing method was determined to be 6 mL of water (pH 6-7) followed by 6 mL of methanol, with other conditions remaining unchanged, to meet the experimental requirements for simultaneous processing of multiple colorants.

Product Selection and Usage Method

Sample	Sample Extraction Steps	Unit	Part Number
Liquid and some solid samples (Beverages, alcoholic beverages, dairy products, jelly, candied fruit, edible gelatin products, prepared aquatic products, seasonings, pickled vegetables, etc.)	▪ Accurately weigh 2 g of the red wine sample (accurate to 0.001 g) and into a 50 mL centrifuge tube with a stopper. ▪ Add 600 µL of the mixed standard solution and 25 mL of the ethanol-ammonia solution. Vortex for 1 minute, then ultrasonically extract at 50°C for 20 min. Centrifuge at 8000 rpm for 5 minutes and transfer the supernatant to a 50 mL volumetric flask. Add 15 mL of the ethanol-ammonia solution and repeat the extraction once. Combine the supernatants after centrifugation and dilute to 50 mL with the ethanol-ammonia solution to obtain the extract. ▪ Accurately pipette 10 mL of the extract and concentrate it to approximately 2 mL under nitrogen at 50° C. Redissolve the extract by adding 10 mL of a 5% methanol solution in 2-3 times. This serves as the solution for purification.	150 mg/6 mL (30/Pk)	WA1506-P
Samples with a high oil content (e.g., chocolate products, potato chips, dried tofu, pastries, sauced meat, salad dressing, and ice cream)	▪ Accurately weigh 2 g of the bacon sample (accurate to 0.001 g) into a 50 mL centrifuge tube with a stopper. ▪ Add 600 µL of the mixed standard solution and 20 mL of petroleum ether. Vortex for 1 minute, then shake at a speed of ≥ 250 rpm for 10 minutes. Centrifuge at 8000 rpm for 5 minutes and discard the supernatant. Completely remove the petroleum ether solvent. Add 25 mL of the ethanol-ammonia solution to the deoiled sample and vortex for 1 minute. Sonicate for 20 minutes at 50 °C . Centrifuge at 8000 rpm for 5 minutes and transfer the supernatant to a 50 mL volumetric flask. Repeat the extraction one time with 15 mL of the ethanol-ammonia solution. Combine the supernatants after centrifugation and dilute to 50 mL with the ethanol-ammonia solution to obtain the final extract. ▪ Accurately pipette 10 mL of the extract and concentrate it to approximately 2 mL under nitrogen at 50° C. Redissolve the extract by adding 10 mL of a 5% methanol solution in 2-3 times. This serves as the solution for purification.		
Dry solid samples (Brown sugar, hard candy, corn flour, shrimp-flavored chips, tea, spices, etc.)	▪ Accurately weigh 2 g of the sample (accurate to 0.001 g) into a 50 mL centrifuge tube with a stopper. ▪ First, add 5 mL of water to allow the sample to swell. Then, add 600 µL of the mixed standard solution followed by 25 mL of ethanol-ammonia water solution. Vortex the mixture for 1 minute and then ultrasonically extract at 50 °C for 20 minutes. Centrifuge the mixture at 8000 rpm for 5 minutes and transfer the supernatant to a 50 mL volumetric flask. Add 15 mL of ethanol-ammonia solution and repeat the extraction. Combine the supernatants after centrifugation and dilute to 50 mL with ethanol-ammonia solution to obtain the extract. ▪ Accurately pipette 10 mL of the extract and concentrate it to approximately 2 mL under nitrogen at 50° C. Redissolve the extract by adding 10 mL of a 5% methanol solution in 2-3 times. This serves as the solution for purification.		

Operating Process

Activation: Activate the Cleanert PWAX Plus solid phase dedicated extraction column (Cat. No.: WA1506-P) for synthetic colorants using 6 mL of methanol followed by 6 mL of water. Ensure the column remains moist throughout the process.

Sample Loading: Immediately after activation, load the purified solution onto the Cleanert PWAX Plus solid phase extraction column (Cat. No.: WA1506-P) at a flow rate of 1.0 mL/min.

Washing: Sequentially wash the Cleanert PWAX Plus dedicated solid phase extraction column for synthetic colorants (Cat. No.: WA1506-P) with 6 mL of 2% formic acid aqueous solution and 6 mL of methanol, discard the eluent, and vacuum pump for 2 min until the column is nearly dry.

Elution: Elute the sample with 6 mL of a 2% ammonia methanol solution, add 3 mL each time in two times at a flow rate below 1.0 mL/min. Collect the eluate and concentrate it to near dryness under nitrogen at 50 °C. Accurately add 2 mL of a pH=9 ammonium acetate solution to dissolve the residue. Filter the resulting solution through a 13 mm, 0.45 µm Hydrophilic PVDF syringe filter (P/N: AS071345-19). Discard the first 2-5 drops and collect the subsequent filtrate as the test solution.

Chromatographic Analysis

Column: HyperClone BDS C18 , 5 µm

Specifications: 4.6×250 mm

Cat. No.: 00G-4420-E0

Mobile Phase: A: 20 mmol/L ammonium acetate solution
B: Methanol

Flow Rate: 1.0 mL/min

Injection Volume: 10 µL

Column Temperature: 30°C

Wavelength: 415 nm (tartrazine, quinoline yellow)
520 nm (New Red, Amaranth, Carmine, Sunset Yellow, Allura Red, Acid Red, and Erythrosine)
610 nm (Indigo Carmine, Brilliant Blue)

Gradient:	Time	B%
	0.000	10
	12.00	40
	19.00	50
	22.50	55
	24.00	95
	33.00	95
	34.00	10
	42.00	10

Table 1. Spiked Recovery Results (Spiking Level: 1 mg/kg)

Substance	Potato Chips		Bacon	
	Recovery Rate (%)	RSD%	Recovery Rate (%)	RSD%
Indigo Carmine	96	0.48	101	2.58
Brilliant Blue	100	2.06	94	1.39
Quinoline Yellow	96	1.43	81	1.78
Tartrazine	95	1.63	90	1.29
New Red	100	0.69	91	2.72
Amaranth	103	0.82	82	1.83
Carmine	93	0.91	80	1.02
Sunset Yellow	110	0.00	99	4.92
Allura Red	103	1.25	95	4.50
Acid Red	102	0.41	87	1.03
Erythrosine	93	0.94	87	4.04

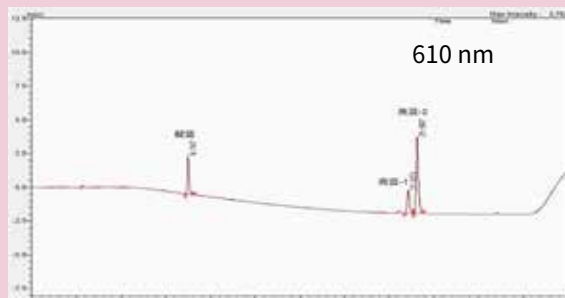
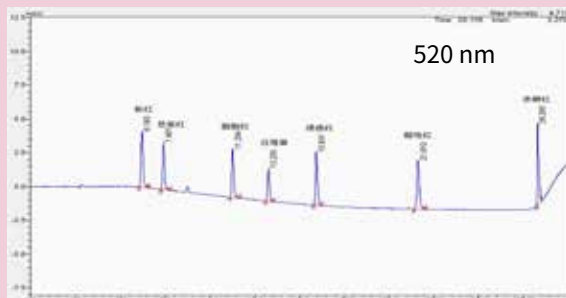
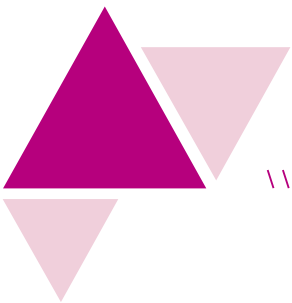


Figure 1. Chromatogram of 11 Synthetic Colorants at A Concentration of 1 ppm



Experimental Results

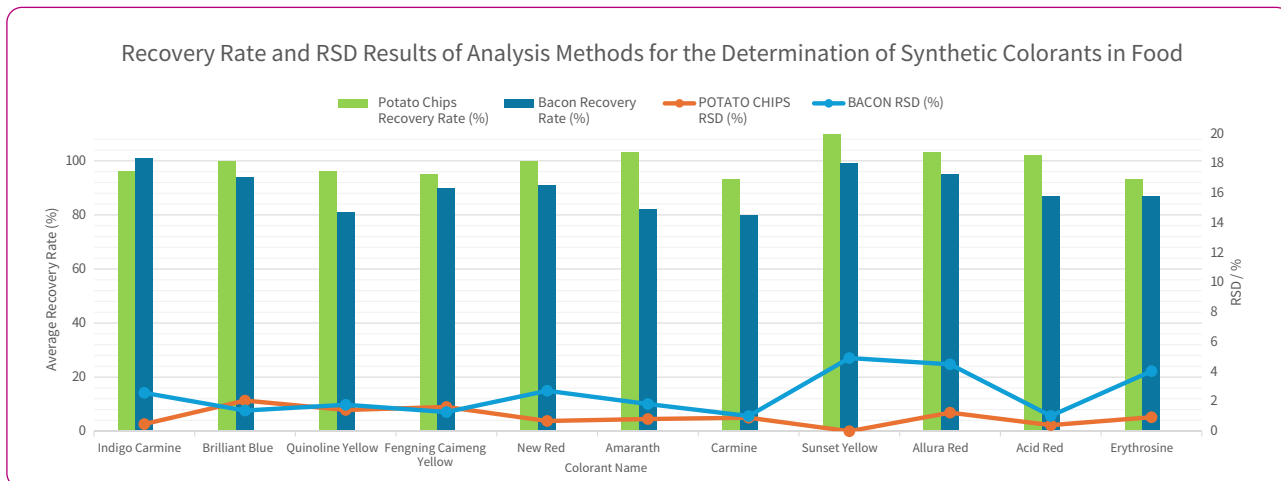


Figure 2. Recovery Rate and RSD Results of Analysis Methods for the Determination of Synthetic Colorants in Food

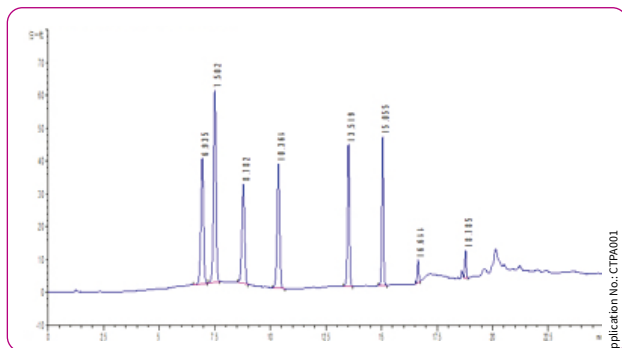
Ordering Information

Product Name	Type	Unit	Part Number
Cleanert PWAX Plus	SPE Cartridge	150 mg/6 mL (30/Pk)	WA1506-P

Cleanert PA Polyamide Column

Description

Polyamide, also known as nylon, is a type of polymer formed through the polymerization of amide. It encompasses a wide range of varieties, with monomers including caprolactam, hexamethylenediamine, and oxalic acid. The amide bond within the molecule constitutes a crucial structural element and serves as the basis for forming hydrogen bonds with other polar groups. It is frequently employed in the analysis of artificial synthetic pigments to eliminate interferences or to remove synthetic pigments from samples.



Chromatogram of 8 Synthetic Pigments in Red Wine

Reference Standard

Polyamide sorbent and SPE cartridge are used for food detection. They can also be used as decolorization cartridge in the detection of hexavalent chromium in leather, as described in the standard "Leather and Fur—Chemical Tests—Determination of Chromium (VI) Content" (GB/T 22807-2019).

Ordering Information

Product Name	Type	Unit	Part Number
Cleanert PA Polyamide Cartridge	SPE Cartridge	150 mg/3 mL (50/Pk)	JXA1503
		500 mg/3 mL (50/Pk)	JXA5003
		250 mg/6 mL (30/Pk)	JXA2506
		500 g/6 mL (30/Pk)	JXA5006
		1 g/6 mL (30/Pk)	JXA0006
		1 g/12 mL (20/Pk)	JXA00012
		2 g/12 mL (20/Pk)	JXA200012
		3 g/25 mL (15/Pk)	JXA300025
		4 g/25 mL (15/Pk)	JXA400025
		4 g/60 mL (10/Pk)	JXA400060
	Sorbent	10 g/bottle	JXA0010
		100 g/bottle	JXA0100
		500 g/bottle	JXA0500
		1000 g/bottle	JXA1000

Operating Process

Activation: 6 mL methanol and then 6 mL water (pH 6–7)

Sample loading: Refer to the national standard method. Select the appropriate extract based on the sample matrix and load the entire extract onto the SPE cartridge (Cleanert PA 1 g/6 mL).

Washing: 6 mL water (pH=4), 6 mL methanol:formic acid (6:4), 6 mL water (pH 6–7).

Elution: 6 mL of 2% ammonium methanol.

Concentration: Collect the eluent and evaporate to dryness with nitrogen gas. Dilute to 1 mL with water, filter through a 0.45 µm syringe filter, and proceed to analysis.

Precautions:

- This purification cartridge is suitable for various sample types, including beverages, alcoholic drinks, liquid and solid seasonings, sauces, jellies, canned fruits, and meat products.
- For liquid samples with a high pH, adjust the pH to approximately 6 using a citric acid solution.
- If the sample has a high alcohol content, it is recommended to perform alcohol removal before loading.
- Filter the eluent using a hydrophilic syringe filter. The Agela hydrophilic PTFE syringe filter is recommended as it won't cause pigment adsorption.



Cleanert Sudan Dedicated Detection Column for Sudan

Description

GB/T 19681-2005 "The Method for The Determination of Sudan Dyes in Foods - High Performance Liquid Chromatography" utilizes n-hexane as the extraction solvent and an alumina solid phase extraction column for sample purification. However, this method involves a complex sample processing procedure, and the activity of alumina is difficult to control, making it challenging to ensure a consistent recovery rate.

Agela has developed the Cleanert Sudan column, featuring an aromatic functional group polymer material, specifically for Sudan Red detection. This column offers several advantages over the national standard method, including a more stable recovery rate, reduced solvent consumption for greater environmental friendliness, and a simplified methodology.

Experimental results demonstrate an average Sudan Red recovery rate of 87%~102% across four different sample types including chili powder, chili oil, ham sausage, and hot pot ingredients.

Product Selection and Usage Method

Sample	Sample Extraction Steps	Unit	Part Number
Powdered samples, such as chili powder	Weigh 0.5 g of the sample (accurate to 0.001 g) into a triangular flask. Add 5 mL of n-hexane and sonicate for 10 minutes. Filter the mixture and centrifuge the filtrate at 5000 r/min for 5 minutes. Collect 3 mL of the supernatant for purification. Treatment of spiked samples: Add 2 mL of 4 µg/mL Sudan red mix standard solution and 4 mL of n-hexane to 0.5 g (accurate to 0.001 g) of chili powder, and then perform the treatment according to the above method.	500 mg/6 mL (30/Pk)	SD5006
Oily samples, such as chili oil	Weigh 0.5 g (accurate to 0.001 g) of the sample into a small beaker. Add 3 mL of n-hexane to dissolve the sample. Vortex for 1 minute to ensure proper mixing, and then proceed with purification. Treatment of spiked samples: Add 1 mL of 4 µg/mL Sudan red mix standard solution and 4 mL of n-hexane to 0.5 g (accurate to 0.001 g) of chili oil sample, and then perform the treatment according to the above method.	500 mg/6 mL (30/Pk)	SD5006
Ham sausage samples	Cut the ham sausage into small dices and weigh out 3.0 g (accurate to 0.001 g). Place the diced sausage into a 10 mL centrifuge tube and add 5 mL of n-hexane. Sonicate the mixture for 10 minutes, then centrifuge at 5000 r/min for 5 minutes. Collect 3 mL of the supernatant for purification. Treatment of spiked samples: Cut the ham sausage into small dices and weigh out 3.0 g (accurate to 0.001 g). Place the diced sausage into a 10 mL centrifuge tube. Add 2 mL of 4 µg/mL Sudan red mix standard solution and 4 mL of n-hexane, and then perform the treatment according to the above method.	500 mg/6 mL (30/Pk)	SD5006
Sauce samples, such as hot pot ingredients	Weigh out 1.0 g of hot pot ingredients (accurate to 0.001 g) and add 1 mL of water, followed by 5 mL of n-hexane. Vortex the mixture for 3 minutes and then sonicate for 10 minutes. Centrifuge the mixture at 6000 r/min for 5 minutes. Collect 3 mL of the upper organic phase and add 0.5 g of anhydrous sodium sulfate. Vortex for 0.5 minutes and allow the mixture to settle. Collect the supernatant as the loading solution. Treatment of spiked samples: Add 1 mL of water to 1.0 g (accurate to 0.001 g) of hot pot ingredients. Then, add 2 mL of a 4 µg/mL Sudan red mixed standard solution and 4 mL of n-hexane. Finally, proceed according to the above method.	500 mg/6 mL (30/Pk)	SD5006

Operating Process

Activation: Add 5 mL of dichloromethane, followed by 5 mL of n-hexane, to the Cleanert Sudan cartridge.

Extraction: Add the solution to be purified to the Cleanert Sudan column. Rinse the sample bottle with 1 mL of n-hexane and add it to the SPE cartridge. Discard the effluent.

Washing: After the sample solution has completely flowed through, wash with 3 mL of a 3% isopropanol-n-hexane solution. Discard the eluent. Turn on the vacuum pump and drain the cartridge.

Elution: Elute the sample with 3 mL of dichloromethane and collect the eluent.

Drying and Dilute to Volume: Dry the eluent under nitrogen at 50° C. Add 1 mL of acetonitrile to dissolve the residue, filter the solution through a 0.45 µm PTFE organic syringe filter, and then analyze it by HPLC.

Chromatographic Analysis

Column: Venusil MP C18
Specifications: 5 µm, 100 Å, 4.6×150 mm
Cat. No.: VA951505-0
Mobile Phase: Acetonitrile:Water (v/v) = 97:3
Flow Rate: 1.0 mL/min
Injection Volume: 20 µL
Column Temperature: 35°C
Detection wavelength: 520 nm

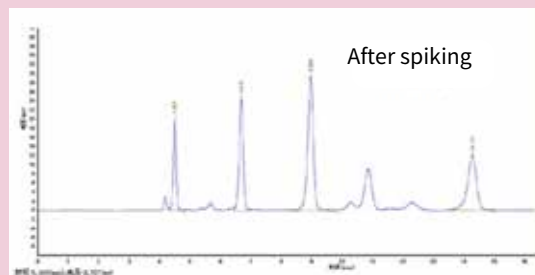
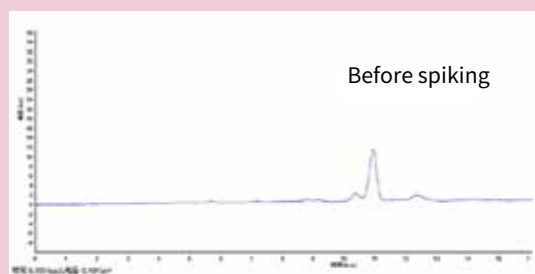


Figure 1. Liquid Chromatogram of Chili Powder Sample

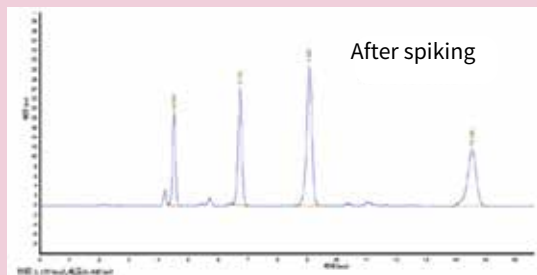
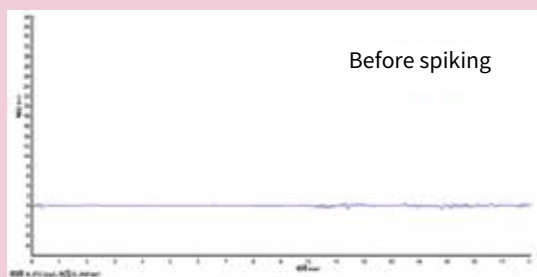


Figure 2. Liquid Chromatogram of Chili Oil Sample

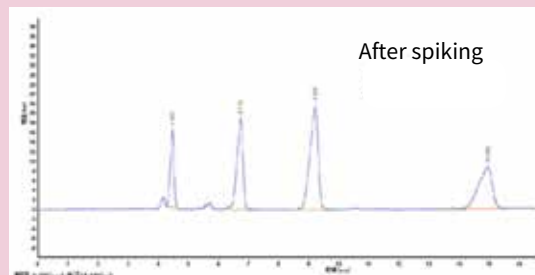
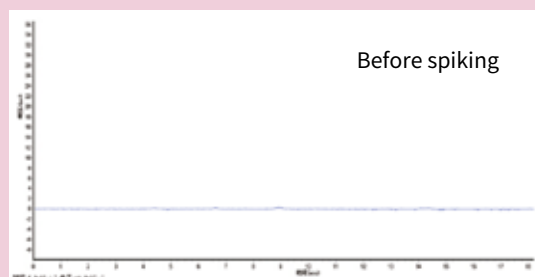


Figure 3. Liquid Chromatogram of Ham Sausage Sample

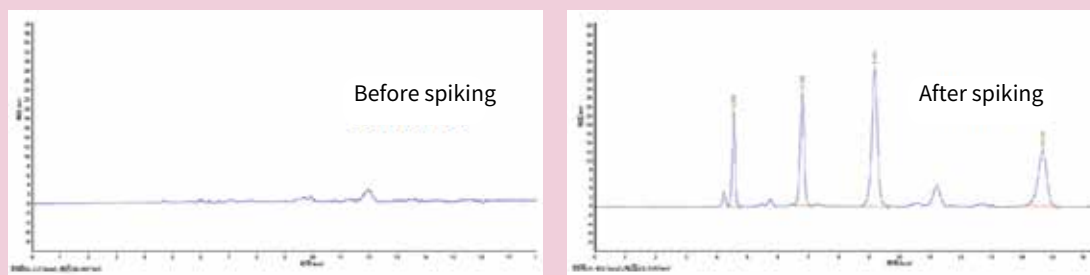
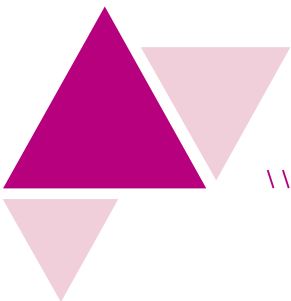


Figure 4. Liquid Chromatogram of Hot Pot Ingredients Sample

Table 1. Average Recovery Rate and RSD of Sudan Red in 4 Sample Types

Sample Name	Substance Name	Low Concentration (0.4 mg/L)		High Concentration (4 mg/L)	
		Average Recovery Rate (%)	RSD(n=5)/%	Average Recovery Rate (%)	RSD(n=5)/%
Chili Powder	Sudan Red I	96.00%	5.02	96.00%	5.02
	Sudan Red II	95.19%	1.42	95.19%	1.42
	Sudan Red III	98.82%	1.62	98.82%	1.62
	Sudan Red IV	97.16%	3.73	97.16%	3.73
Chili Oil	Sudan Red I	93.42%	4.35	93.42%	4.35
	Sudan Red II	91.67%	8.46	91.67%	8.46
	Sudan Red III	100.29%	4.43	100.29%	4.43
	Sudan Red IV	100.01%	3.83	100.01%	3.83
Ham Sausage	Sudan Red I	90.63%	3.89	90.63%	3.89
	Sudan Red II	87.60%	6.1	87.60%	6.1
	Sudan Red III	101.29%	3.89	101.29%	3.89
	Sudan Red IV	92.68%	8.19	92.68%	8.19
Hot Pot Ingredients	Sudan Red I	99.67%	5.53	99.67%	5.53
	Sudan Red II	87.95%	4.67	87.95%	4.67
	Sudan Red III	99.02%	5.56	99.02%	5.56
	Sudan Red IV	91.05%	7.4	91.05%	7.4

Ordering Information

Product Name	Type	Unit	Part Number
Cleanert Sudan Dedicated Column for Sudan Detection	SPE Cartridge	500 mg/6 mL (30/Pk)	SD5006

Cleanert PAE Phthalate Detection Column



Description

The Cleanert PSA/Silica composite sorbent glass cartridge is fully applicable to the "GB5009.271-2016 National Food Safety Standard -Determination of Phthalates in Food", fully meeting the national standard method's sample preparation requirements.

Cleanert PAE plasticizer detection cartridges are a series of sample preparation cartridges specifically designed for detecting plasticizers in various food and healthcare products. These cartridges, used in conjunction with liquid chromatography or gas chromatography-mass spectrometry, deliver excellent purification results and high sample recovery rates.

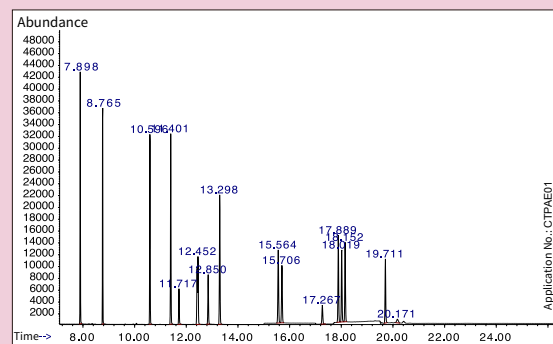
Product Selection and Usage Method

Sample	Usage Method	Unit	Part Number
Liquid Sample: Vegetable Oil Sample	Weigh 0.5 g of the homogenized sample. Add 100 μL of n-hexane and 2 mL of acetonitrile sequentially. Vortex for 1 minute, followed by ultrasonic extraction for 20 minutes. Centrifuge at 4000 r/min for 5 minutes and collect the supernatant. Add 2 mL of acetonitrile to the residue, vortex for 1 minute, and centrifuge again at 4000 r/min for 5 minutes. Repeat this extraction step once more with another 2 mL of acetonitrile. Combine all three supernatants and proceed with SPE purification. Activation: 5 mL of dichloromethane, 5 mL of acetonitrile. Sample loading: Load all of the liquid to be purified. (collect) Elution: 5 mL of acetonitrile (collect). Combine the collected solution and evaporate to near dryness at 40° C (leaving an oily, viscous liquid). Accurately dilute to 2 mL with n-hexane for GC-MS analysis.	500 mg/500 mg/6 mL (30/Pk)	PAE0006-G
Semi-solid samples: sesame paste, oily seasoning sauce, etc.	Weigh 0.5 g of the homogenized sample and add 1 mL of n-hexane. Vortex for 2 minutes, then add 5 mL of acetonitrile and vortex for 1 minute. Perform ultrasonic extraction for 20 minutes, then centrifuge at 4000 r/min for 5 minutes. Collect the supernatant. Repeat the extraction once with 5 mL of acetonitrile and combine the supernatants. Dry under nitrogen at 40° C. Add 6 mL of acetonitrile, vortex to mix well, and proceed with SPE purification. Activation: 5 mL of dichloromethane, 5 mL of acetonitrile. Loading: Load all of the liquid to be purified. (collect) Elution: 5 mL of acetonitrile (collect). Combine the collected liquid, evaporate to near dryness at 40° C, and then dilute the volume to 2 mL with n-hexane for GC-MS analysis.		
Solid samples: butter, etc.	Weigh 0.5 g of the homogenized sample and add 1 mL of n-hexane. Vortex for 2 minutes. Then, add 5 mL of acetonitrile and vortex for 1 minute. Extract using ultrasonication for 20 minutes, followed by centrifugation at 4000 r/min for 5 minutes. Collect the supernatant. Repeat the extraction once with another 5 mL of acetonitrile and combine the supernatants. Evaporate the combined supernatant to near dryness at 40° C under nitrogen. Finally, add 6 mL of acetonitrile, vortex to mix well, and proceed with SPE purification. Activation: 5 mL of dichloromethane, 5 mL of acetonitrile. Loading: Load all of the liquid to be purified.(collect) Elution: 5 mL of acetonitrile (collect). Combine the collected liquid, evaporate to near dryness at 40° C using nitrogen, and then dilute the volume to 2 mL with n-hexane for GC-MS analysis.		

*Products specifically designed for plasticizer analysis utilize glass tubes, ensuring the absence of background residues and enabling reliable results.

Chromatographic Analysis

Column: ZB-5MS Plus Column
Specifications: 30 m × 0.25 mm × 0.25 μm
Cat. No.: 7HG-G030-11
Injection: Splitless injection at 250° C, 1 μL
Carrier gas: Helium, purity ≥ 99.999%, 1 mL/min
Heating procedure: Hold at 50° C for 1 minute, increase to 220° C at 20° C/minute and hold for 1 minute, then increase to 280° C at 5° C/minute and hold for 4 minutes.



Standard Chromatogram of 16 Phthalates at 0.2 μg/mL

Ordering Information

Product Name	Type	Description	Unit	Part Number
Cleanert PAE Dedicated Column for Phthalate Detection	SPE Cartridge	For GB 5009.271-2016, Determination of Phthalates in Food. PSA/Silica	500 mg/500 mg/6 mL (30/Pk)	PAE0006-G

Cleanert EC Dedicated Column for Ethyl Carbamate

— Mandatory Standard for Ethyl Carbamate has been Released!

Description

The national standard method of GB 5009.223-2014 provides for the determination of ethyl carbamate content in beer, wine, yellow wine, liquor and other alcoholic beverages as well as soy sauce by gas chromatography-mass spectrometry (GC-MS). The content and detection of ethyl carbamate have become a significant concern for businesses, institutions, and testing facilities involved with alcoholic beverages and fermented foods. To address this, our company has developed a commercially available diatomite sample preparation cartridge based on this national standard method. This user-friendly cartridge meets all standard requirements and is suitable for use with a wide range of samples.

The "Alkaline diatomite solid phase extraction cartridge" mentioned in the GB 5009.223-2014 standard does not specify the treatment method of sorbent. After extensive standard validation, our company ensures that the Cleanert EC column, when used in conjunction with national standard products, can be applied for the determination of ethyl carbamate in liquor. The detection limit is 2.0 µg/kg, with a recovery rate ranging from 98.3% to 104.5%. The method is simple, the product is stable, and the results are accurate and sensitive, fully meeting the detection requirements of the national food safety standard GB5009.223-2014.

Operating Process



Sample loading: Measure 2 mL of the liquor sample. Referring to the national standard method, mix the sample and load it onto the dedicated ethyl carbamate column. Allow the sample to slowly infiltrate into the Cleanert EC dedicated column for solid phase extraction of ethyl carbamate and let it stand for 10 minutes.

Washing: wash the cartridge with 10 mL of n-hexane and squeeze it dry.

Elution: Elute with 10 mL of a 5% ethyl acetate/ether solution.

Concentration: Collect the sample into a 10 mL stoppered graduated test tube, and gently blow it with nitrogen at room temperature until the volume reaches approximately 0.5 mL. Then, dilute the volume to 1.0 mL with methanol to prepare the test solution for GC/MS analysis.

GC-MS Conditions

Column: ZB-WAX
Specifications: 30 m × 0.25 mm × 0.25 µm
Cat. No.: 7HG-G007-11
Injection: Splitless injection at 220° C, 1-2 µL
Carrier gas: Helium, purity ≥ 99.999%, flow rate 1 mL/min
Heating procedure: Initial temperature 50° C, hold for 1 min, increase to 180° C at 8° C/min, then increase to 210° C at 15° C/min, and hold for 5 min.

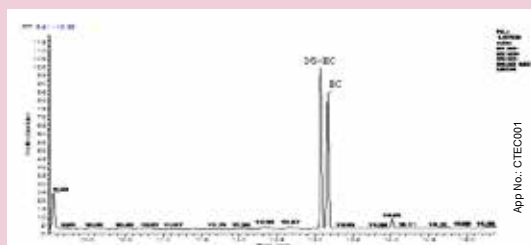


Figure 1. Total Ion Chromatogram of Ethyl Carbamate and The Internal Standard

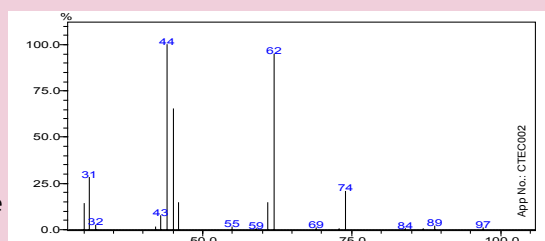


Figure 2. Mass Spectrum of Ethyl Carbamate

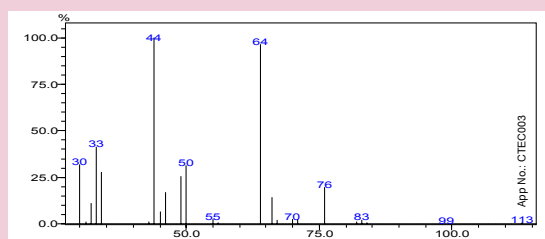


Figure 3. Mass Spectrum of Internal Standard D5- Ethyl Carbamate

Ionization mode: EI source

Selected monitoring ions (m/z) of ethyl carbamate: 62, 76, 89; quantitative ion: 62

Selected monitoring ions (m/z) of D5-ethyl carbamate: 64, 76; quantitative ion: 64



Ordering Information

Product Name	Type	Unit	Part Number
Cleanert EC (Dedicated column for ethyl carbamate) Applicable to GB 5009.223-2014	SPE Cartridge	12 mL (20/Pk)	GB50092232014

Cleanert MCPD Dedicated Column for Chloropropanol

Description

Cleanert MCPD is applicable for determining chloropropanol, fatty acid esters, and glycidyl esters in food according to the Chinese National Food Safety Standard GB 5009.191-2024. We designed a commercialized diatomite sample preparation cartridge according to the national standard method, and combined with gas chromatography tandem mass spectrometry (GC-MS), a validation test was carried out for the determination of 3-chloro-1,2-propanediol (3-MCPD) in soy sauce. The recoveries were above 90%, which meet the requirements of the standard, and the method is easy to operate and has good stability.

Operating Process

Sample Extraction

Weigh 4 g of the soy sauce sample into a 50 mL centrifuge tube. Add 40 μ L of 0.8 μ g/mL D5-3-MCPD internal standard solution, ultrasonicate for 5 minutes to mix well, and proceed to the purification step.

Sample Purification

Cartridge: Cleanert MCPD Dedicated Column for Chloropropanol (maximum loading volume: 5 mL)
Cat. No.: LBC500030
Sample Loading: Load the solution to be purified and equilibrate for 10 minutes.
Washing: Wash with 10 mL of n-hexane, discard the effluent, and drain.
Elution: Elute with 15 mL of ethyl acetate, collect the eluate, and concentrate to approximately 0.5 mL under a stream of nitrogen at 30°C. Dilute the volume to 2 mL with n-hexane and proceed with derivatization.
Derivatization: Add 0.04 mL of heptafluorobutyrylimidazole (HFBI) to the above solution to be derivatized, tighten immediately, vortex and mix for 30s. Hold at 70°C for 20 min. Remove and cool to room temperature, add 2 mL of 20% sodium chloride solution, vortex and mix for 1 min, allow phases to separate until the aqueous phase clarifies. Transfer the upper n-hexane layer, add about 0.3 g of anhydrous sodium sulfate for dewatering, transfer the supernatant to the vial for analysis.

Experimental Results

As shown in Table 1, the spiked recovery rate of 3-MCPD in soy sauce, detected using solid phase extraction combined with GC-MS, was above 90%, meeting the standard requirements. Figure 1, 2, and 3 show that the peak shape and retention time of 3-MCPD detected by the ZB-5MS column were similar to that of the national standard.

Table 1. Results of the 3-MCPD Spiked Recovery Experiment in Soy Sauce (Spiking Level: 0.02 mg/kg, n=3)

Substance Name	Retention Time (min)	Average Recovery Rate (%)	Coefficient of Variation (%)
3-MCPD Derivative	14.990	91.0	3.9

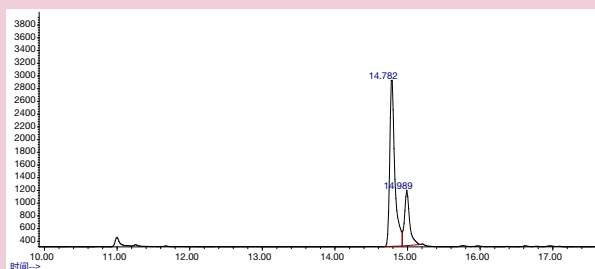


Figure 1. Chromatogram of the 0.04 µg/mL 3-MCPD Derivative and Internal Standard Derivative Standard Solution

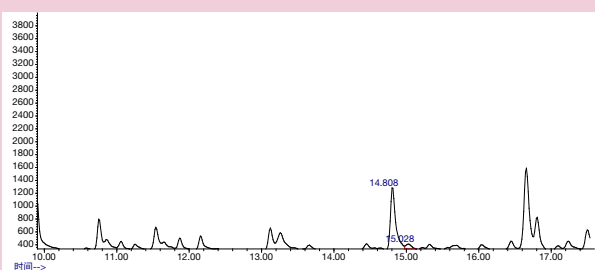


Figure 2. Blank Chromatogram of Soy Sauce Matrix

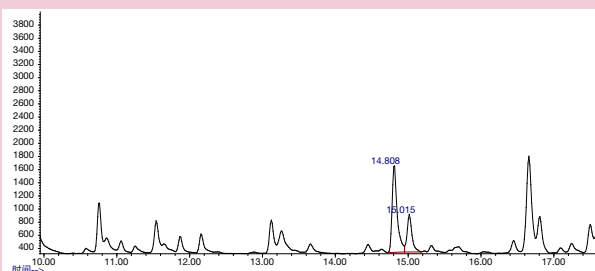


Figure 3. Chromatogram of Soy Sauce Matrix Spiked at 0.02 mg/kg

Column: Zebron ZB-5MS column
Specifications: 30 m × 0.25 mm × 0.25 µm
Cat. No.: 7HG-G010-11

Injection port temperature: 250°C; Column temperature: Initial temperature 50°C, hold for 1 min, increase to 90°C at 2°C/min, then increase to 270°C at 40°C/min and hold for 5 min.

Carrier gas: Helium, purity ≥99.999%.

Flow Rate: 1 mL/min

Ionization mode: EI source

Ion source temperature: 250°C

Solvent delay: 5 min

Injection mode: Splitless injection

Injection Volume: 1 µL

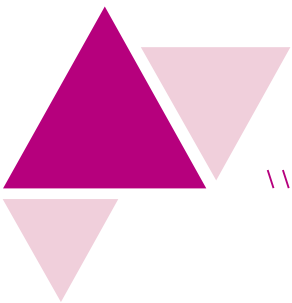
Monitoring mode: Selected ion monitoring (SIM)

Table 2. Monitoring Ion Parameters of 16 Phthalates

Substance Name	Qualitative ion (m/z)	Quantitative ion (m/z)
3-MCPD Derivative	275, 289, 291	253

Ordering Information

Product Name	Type	Unit	Part Number
Cleanert MCPD (Dedicated Column for Chloropropanol)	SPE Cartridge	5 g/30 mL (15/Pk)	LBC500030
		4 g/30 mL (15/Pk)	LBC400030
		2.5 g/12 mL (20/Pk)	LBC250012



Dedicated Column for Honey syrup Identification

Description

The national standard method GB/T 18932.2-2002 ("Determination of High Fructose Corn Syrup in Honey - Thin Layer Chromatography") ensures the high quality of honey products in the market. The experimental principle of this national standard is as follows: High molecular weight sugars in the sample are enriched and concentrated through an activated carbon diatomite cartridge, and then separated and detected by thin-layer chromatography. By comparing with pure honey adulterated with a certain amount of high-fructose corn syrup, the presence of high-fructose corn syrup in honey is determined.

The dedicated column for honey syrup identification (Cat. No.: SYR5006) eliminates the need for manual packing of chromatographic columns. Commercial SPE columns ensures the stability of packing, reduces detection costs, and improves work efficiency, while meeting the minimum detection limit required by the national standard and reducing the sample volume needed for the detection limit.

Operating Process



Activation: Pass 5 mL of methanol and 5 mL of water through the cartridge, allowing it to flow naturally without pressure. Discard the eluent.

Sample Loading: Weigh 5 g of the sample (accurate to 0.001 g) and dissolve it in 50 mL of water. Mix well. Pass 10 mL of the sample solution through the cartridge, allowing it to flow naturally without pressure. Discard the effluent.

Washing: wash with 5 mL of a 17% (V/V) ethanol solution, allowing it to flow through naturally without pressure. Discard the eluent.

Elution: Elute with 5 mL of a 50% (V/V) ethanol solution, allowing it to flow through naturally without pressure. Collect the eluent in a 10 mL reagent bottle.

Nitrogen Evaporation: Evaporate the collected liquid under a stream of nitrogen at 35° C for 15 minutes, then increase the temperature to 80° C and continue evaporation until the eluent is dry. After adding 1mL of ethanol aqueous solution (30%, V/V) to dissolve, it is used as the spotting solution for thin layer chromatography and set aside for later use.

Ordering Information

Product Name	Type	Unit	Part Number
Dedicated Column for Honey syrup Identification	SPE Cartridge	500 mg/6 mL (30/Pk)	SYR5006



Dedicated Column for Environmental Sample Detection

Cleanert DNPH Aldehyde and Ketone Gas Sampling Tube

Description

The Cleanert DNPH-Silica Aldehyde and Ketone Gas Sampling Tube utilizes the derivatizing agent DNPH (2,4-dinitrophenylhydrazine) to react specifically with the carbonyl group in the carbonyl compound, and the generated derivatives are then separated by chromatography. This tube is primarily used for collecting aldehyde and ketone pollutants in environment, automotive emissions, and indoor air. It can be used to analyze 14 kinds of aldehyde and ketone organic components, including formaldehyde, acetaldehyde, propionaldehyde, acrolein, butyraldehyde, valeraldehyde, isovaleraldehyde, hexanal, benzaldehyde, ortho -, meta -, and p-methylbenzaldehyde, 2,5-dimethylbenzaldehyde, acetone, butanone, pentanone, cyclohexanone, and acetophenone.

Instructions

- (1) Technical specifications: Average background value: $\leq 0.1 \mu\text{g}$ (calculated by formaldehyde). Maximum sampling volume: $\leq 75 \mu\text{g}$ (calculated by formaldehyde). Maximum sampling pressure: greater than 0.15 MPa.
- (2) Storage conditions: Upon receipt, the product should be stored at -20°C in a freezer, preferably in a separate refrigerator to avoid cross-contamination. In its unopened state, it can be stored for 6 months at -20°C in a dedicated freezer. Once opened, please use it as soon as possible.

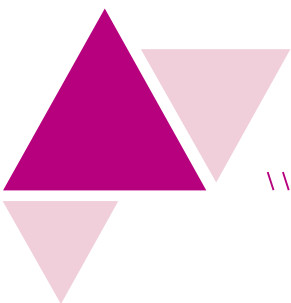
Applicable Standards:

HJ/T 400-2007 Determination of Volatile Organic Compounds and Carbonyl Compounds in Cabin of Vehicles
GB/T 27630-2011 Guidelines for Air Quality Assessment of Passenger Car



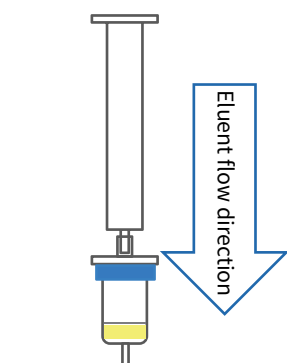
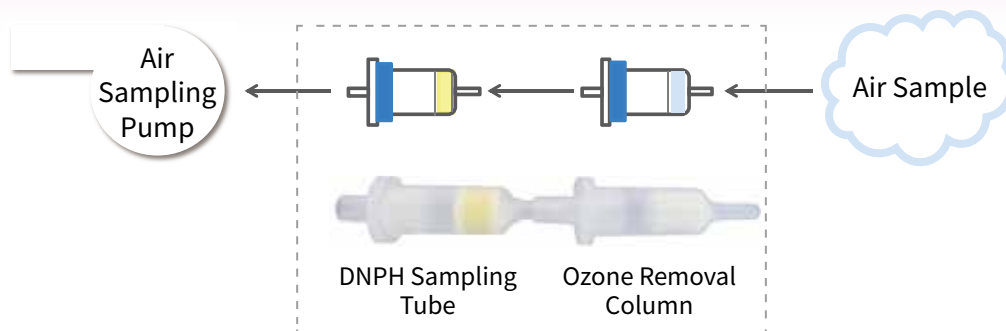
Innovation Advantages

- (1) The new column tube features a twist-off cap, reducing the time needed to unscrew the plunger and improving efficiency.
- (2) A DNPH protection column has been added, which can selectively react with aldehyde and ketone substances, serving to protect the DNPH sampling tube. The sampling tubes are packaged in vacuum-sealed aluminum foil bags. After sampling, the tubes will be placed back into the sealed aluminum foil bags for storage. At this point, it is inevitable that some air will remain inside the bag. The DNPH protection column will absorb aldehydes, ketones, and ozone inside the bag, preventing changes in the sampling tubes and ensuring the accuracy of the sampling data.



Operating Process

Sampling: Connect the sampling tube to the gas sampling pump. Set a fixed sampling flow rate before sampling.



Elution: Immediately after sampling, connect an empty column or syringe to the sampling end. Elute the 2,4-dinitrophenylhydrazone formed during the reaction using acetonitrile as the eluent for subsequent HPLC analysis.

Ordering Information

Product Name	Type	Unit	Part Number
Cleanert DNPH-Silica Aldehyde and Ketone Gas Sampling Tube	Cartridge	200 mg/3 mL (20/Pk)	DN2003
		200 mg/1 mL (20/Pk)	IC-DN2001
		350 mg/1mL (20/Pk)	IC-DN3501
		1 g/6 mL (20/Pk)	DN0006
Cleanert Ozone Removal Tube	Cartridge	1.4 g/2.5 mL (40/Pk)	KI140
Airborne Aldehyde and Ketone Gas Sampling Tube Adapter	Accessories	5/Pk	ZJT-DN

Cleanert ACA Dedicated Column for Acrylamide Detection



Description

Cleanert ACA utilizes a specialized carbon material, demonstrating strong adsorption capacity for highly polar compounds and acrylamide in water samples. In comparison, both hydrophilic-lipophilic balanced polymer materials and ordinary graphitized carbon materials exhibited acrylamide breakthrough when challenged with large sample loads.

Currently, the methods used to detect acrylamide are high performance liquid chromatography tandem mass spectrometry (HPLC-MS/MS) and gas chromatography (GC-MS/MS), which are also the two methods used in the Standard Test Methods for Drinking Water (GB/T 5750.8-2023) Part 8: Organic Matter Indicators. Compared with GC, which involves multiple steps, low derivatization efficiency, and potential solvent contamination, Cleanert ACA is ideal for HPLC-MS/MS sample preparation. It eliminates the need for bromine reactions, accommodates larger sample volumes, utilizes less organic solvent, and offers ease of operation.

Operating Process

(1) Oily solid samples, such as potato chips

Weigh 2 g of the sample and grind it into a powder. Add 30 mL of ultrapure water, vortex thoroughly, and sonicate for 10 minutes. Centrifuge the mixture at 6000 rpm. Collect 15 mL of the supernatant and add 5 mL of n-hexane for degreasing. Vortex and centrifuge the mixture again, then discard the upper n-hexane layer. Repeat the extraction process once more. Finally, collect 15 mL of the sample solution to be treated.

Activation: Add 5 mL of methanol and 5 mL of pure water to the column, then drain it.

Loading: Load the entire volume of the extracted solution onto the column.

Rinsing: Rinse the column with 5 mL of ultrapure water and drain it under vacuum for 30 minutes.

Elution: Use 3 mL of methanol, and collect the entire eluate by vacuum filtration. After concentrating the collected eluate, adjust the volume as needed.

Concentrate to 100-200 µL using a nitrogen evaporator at 40° C, bring to a final volume of 2 mL with pure water, and filter through a 0.22 µm PTFE membrane.

(2) Aqueous Sample

Load aqueous samples directly. If the wastewater contains a large amount of organic matter, pre-filter to remove suspended solids before loading.

Activation: Add 5 mL of methanol and 5 mL of pure water to the column, then drain it.

Sample loading: Take 100 mL of the prepared aqueous sample and add 50 µL of a 100 µg/L ¹³C₃-acrylamide internal standard working solution. Mix well. The final concentration of internal standard solution in the water should be 0.050 µg/L. Pass the aqueous sample through the solid phase extraction column at a flow rate of approximately 5 mL/min.

Drying: Dry the solid phase extraction column with nitrogen for 2 minutes.

Elution: Elute with 10 mL of methanol.

Concentrate to near dryness using a nitrogen evaporator at 40° C, bring to a final volume with 1 mL of pure water and filter through a 0.22 µm aqueous filter membrane.

Ordering Information

Product Name	Type	Unit	Part Number
Cleanert ACA	SPE Cartridge	200 mg/6 mL (30/Pk)	ACA2006 (Food)
		500 mg/6 mL (30/Pk)	ACA5006 (Water Sample)

Cleanert EPH Dedicated Column for Hydrocarbon Detection

Description

Cleanert EPH is a silica gel material treated with a special process, used for separating straight-chain hydrocarbons and aromatic hydrocarbons in environmental samples such as soil and water, thereby enabling the separate determination of the two components. This product is incorporated into the state method of the New Jersey Department of Environmental Protection in the United States, and when used in conjunction with fully automatic solid-phase extraction instrument, it can reduce the impact of human operation on the stability of experimental results, yielding more accurate and stable experimental outcomes



Operating Process

(1) Wastewater samples

Adjust the pH of 2L of aqueous sample to 2 with 6 M HCl; add 60 mL of dichloromethane; shake for 30 min and collect the dichloromethane layer; add 60 mL of dichloromethane and repeat the extraction once, and combine the dichloromethane layers of the two extractions; rotary evaporate to dryness at 60 °C , and then dissolve in 1 mL of n-hexane to be used for sample loading.

Activation: 20 mL n-hexane

Sample loading: Load the entire volume of the extracted solution onto the column.

Elute the straight-chain hydrocarbon components with 20 mL of n-hexane. Drain the column, collect the eluate, and concentrate it to a constant volume.

Add another 20 mL of dichloromethane to elute the cycloalkane components. Collect the eluate, concentrate it to a constant volume, and filter.

Analyze using GC/FID or GC/MS

(2) Soil samples

Thoroughly mix 10-30 g of the sample with an equal mass of anhydrous sodium sulfate. Accurately weigh 10 g of the dried soil mixture. Perform Soxhlet extraction with dichloromethane for 16-24 hours. Rotary evaporate the extract to dryness at 60° C and dissolve the residue in 1 mL of n-hexane for sample loading.

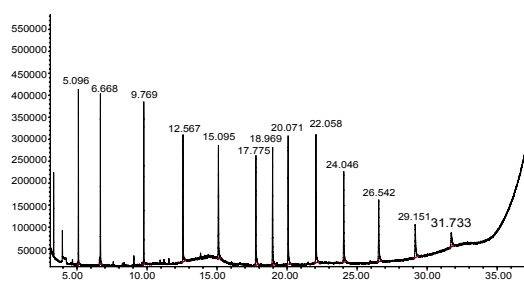
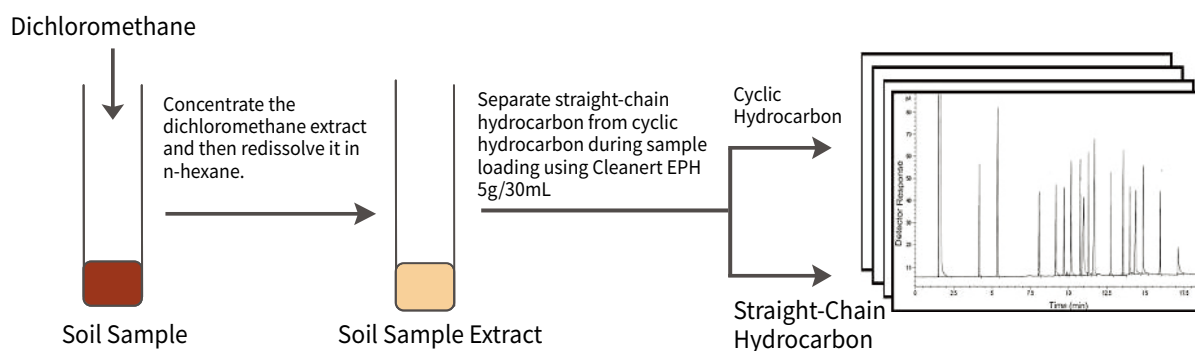
Activation: 20 mL n-hexane

Sample loading: Load the entire volume of the extracted solution onto the column.

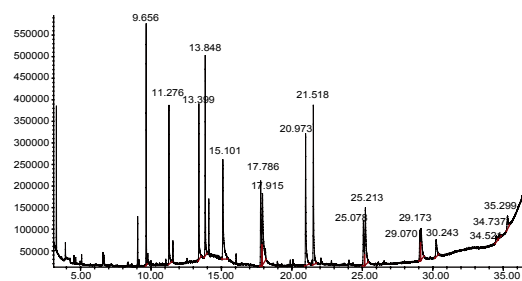
Elute the straight-chain hydrocarbon components with 20 mL of n-hexane. Drain the column, collect the eluate, and concentrate it to a constant volume.

Add another 20 mL of dichloromethane to elute the cycloalkane components. Collect the eluate, concentrate it to a constant volume, and filter.

Analyze using GC/FID or GC/MS



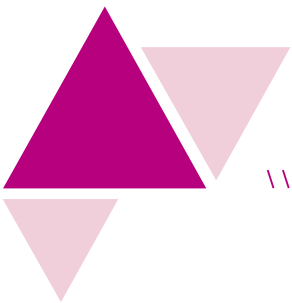
Chromatogram of Straight-Chain Hydrocarbon Components



Chromatogram of Cyclic Hydrocarbon Components

Ordering Information

Product Name	Type	Unit	Part Number
Cleanert EPH	SPE Cartridge	5 g/25 mL (15/Pk)	SI500025-30



Dedicated Column for Textile Detection

Cleanert SLE-OD Dedicated Column for Azo Dye

Description

The Dedicated Column for Azo Dye utilizes specially treated diatomaceous earth sorbent, providing a large specific surface area and balanced surface activity. This creates an ideal liquid-liquid distribution support surface, ensuring the detection sensitivity and stability of aromatic amines.

Modern packing technology ensures a stable column bed and flow rate. This product has been verified by customers to meet the testing requirements of GB/T 17592-2024 for 24 prohibited azo dyes in textiles.



Operating Process

Sampling and Preparation	Cut the sample into small pieces and mix them. Weigh 1 g of the sample and place it in a reactor. Add 15 mL of citrate buffer solution preheated to 70° C. Seal the reactor and shake it to immerse all the samples in the liquid. Place it in a water bath and keep it at 70° C for 30 min. Then open the reactor, add 3 mL of sodium dithionite solution, seal it and shake it immediately. Place the reactor in a 70° C water bath and keep it at 70° C for 30 min. Cool it to room temperature within 3 min after taking it out.
Extraction	Insert the flow rate control needle into the Cleanert SLE-OD diatomaceous earth extraction column, load all the extract, wait for 15 minutes to allow the sample to have sufficient time to adsorb on the sorbent, wash the sample in the reactor with 40 mL of methyl tert-butyl ether (HPLC grade) twice, then add it to the diatomaceous earth column for elution and collect the eluate.
Concentration	Place the round-bottom flask containing the collected methyl tert-butyl ether extract on a rotary evaporator. Spin steam to 1-2 mL at -8 °C condensate temperature, 42 °C water bath temperature, 30 rpm rotary evaporation speed, and 440 mmHg rotary evaporation pressure, then dilute to 2 mL with methyl tert-butyl ether (HPLC grade), pass through a PTFE syringe filter, and put on the machine for inspection.
Analysis	GC-MS analysis

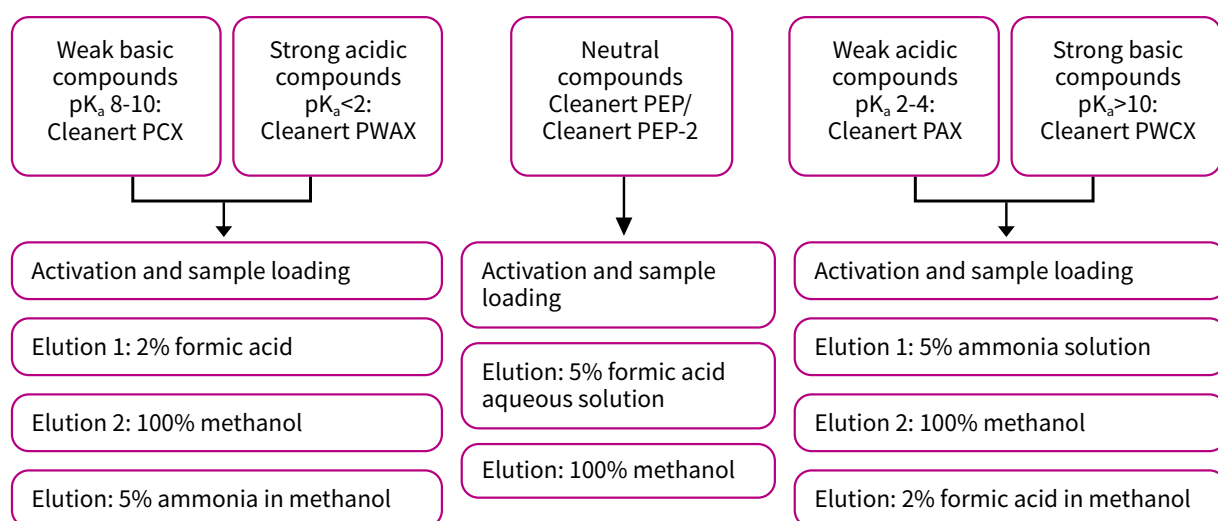
Ordering Information

Product Name	Type	Unit	Part Number
Cleanert SLE-OD Dedicated Column for Azo Dye (specifically designed for pre-treatment in azo dye determination in textiles)	SPE Cartridge	60 mL (10/Pk)	GB/T17592-2006
		60 mL (100/Pk)	GB/T17592-2006-M
		60 mL (2/Pk)	GB/T17592-2006-S

Agela General Preparation Column

Polymer Matrix

Adsorbent Selection



Cleanert PEP

Description

The Cleanert PEP (Polar Enhanced Polymer) is a functionalized polystyrene/divinylbenzene column bonded with pyrrolidone. Its surface possesses both hydrophilic and hydrophobic groups, resulting in balanced adsorption of various polar and non-polar compounds. The operational pH range is 0-14.0. Its adsorption capacity and sample loading are significantly higher than those of C18-bonded silica gel (3-10 times). It can be widely used for the extraction, enrichment, and purification of various compounds. It demonstrates good recovery for many strong hydrophilic compounds that are challenging to retain on C18, such as polychlorophenols, phosphate esters, and drug metabolites.

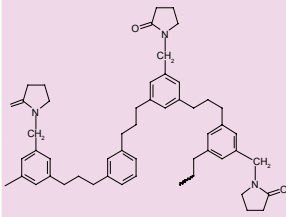
Applicable Standards:

GB/T 22338-2008 Determination of Multi-Residues of Chloramphenicols in Animal-Original Food
BJS 201913 Determination of Five Phenolic Substances, Including Octylphenol, in Food

Parameters

Average particle size:
SPE Cartridge: 75 µm
96 Micro-well plate: 40 µm
96-well plate: 45 µm
Average pore size: 65 Å
Specific surface area: 800 m²/g

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert PEP 	SPE Cartridge	30 mg/1 mL (100/Pk)	PE0301
		60 mg/1 mL (100/Pk)	PE0601
		60 mg/3 mL (50/Pk)	PE0603
		100 mg/3 mL (50/Pk)	PE1003
		150 mg/3 mL (50/Pk)	PE1503
		200 mg/3 mL (50/Pk)	PE2003
		500 mg/3 mL (50/Pk)	PE5003
		150 mg/6 mL (30/Pk)	PE1506
		200 mg/6 mL (30/Pk)	PE2006
		200 mg/6 mL (30/Pk) Glass column tube	PE2006-G
		250 mg/6 mL (30/Pk)	PE2506
		500 mg/6 mL (30/Pk)	PE5006
		1 g/6 mL (30/Pk)	PE0006
		500 mg/12 mL (20/Pk)	PE50012
		1 g/12 mL (20/Pk)	PE00012
	Sorbent	10 g/bottle	PE0010
		50 g/bottle	PE0050
		100 g/bottle	PE0100
		1000 g/bottle	PE1000
	96 micro-well plate	2 mg/mL/well (2/Pk)	PE00201-MW
		5 mg/mL/well (2/Pk)	PE00501-MW
		10 mg/mL/well (2/Pk)	PE0101-MW
		30 mg/mL/well (2/Pk)	PE0301-MW
	96-well plate	10 mg/2 mL/well (2/Pk)	PE0102-W
		30 mg/2 mL/well (2/Pk)	PE0302-W
		50 mg/2 mL/well (2/Pk)	PE0502-W

Cleanert PEP Plus

Description

PEP Plus employs new surface treatment technology and product pre-activation processes based on the PEP sorbent. It reduces operation time by at least 40% through three-step and two-step SPE, eliminating the need for activation and equilibration, and features excellent characteristics of speed, simplicity, and reliability.

Parameters

Average particle size: 75 μm
 Average pore size: 65 $\text{\AA}$
 Specific surface area: 800 m^2/g

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert PEP Plus	SPE Cartridge	60 mg/3 mL (50/Pk)	PE0603X
		200 mg/3 mL (50/Pk)	PE2003X
		150 mg/6 mL (30/Pk)	PE1506X
		200 mg/6 mL (30/Pk)	PE2006X

Cleanert PEP-2

Description

Cleanert PEP-2 is based on a polyvinyl divinylbenzene matrix with pyrrolidone and trace amounts of urea functional groups bonded to the surface to achieve a balanced adsorption of polar and non-polar substances. Due to the introduction of urea groups, PEP-2 has a charge-rich surface structure that allows for the adsorption of most highly polar compounds. Neutral, acidic, and alkaline substances are simply adsorbed on the surface of the material without the need to adjust the pH value, making it more efficient than the first generation of PEP, and making the experimental process easier.

Parameters

Average pore size: 70 Å
Specific surface area: 700 m²/g

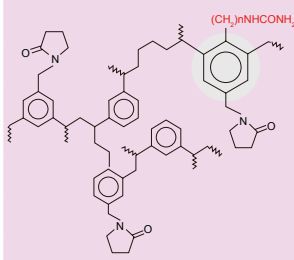
Applicable Standards:

GB 31656.11-2021 National Food Safety Standard-Determination of Oxytetracycline, Tetracycline, Chlortetracycline and Doxycycline Residues in Aquatic Products

GB 31658.17-2021 National Food Safety Standard-Determination of Tetracyclines, Sulfonamides and Fluoroquinolones Residues in Animal Derived Food by Liquid Chromatography-Tandem Mass Spectrometric Method

GB/T 21317-2007 Determination of Tetracyclines Residues in Food of Animal Origin-LC-MS/MS Method and HPLC Method

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert PEP-2 	SPE Cartridge	30 mg/1 mL (100/Pk)	PE0301-2
		60 mg/1 mL (100/Pk)	PE0601-2
		60 mg/3 mL (50/Pk)	PE0603-2
		200 mg/3 mL (50/Pk)	PE2003-2
		250 mg/3 mL (50/Pk)	PE2503-2
		500 mg/3 mL (50/Pk)	PE5003-2
		150 mg/6 mL (30/Pk)	PE1506-2
		200 mg/6 mL (30/Pk)	PE2006-2
		500 mg/6 mL (30/Pk)	PE5006-2
		1 g/6 mL (30/Pk)	PE0006-2
	Sorbent	10 g/bottle	PE0010-2
		100 g/bottle	PE0100-2
	96 micro-well plate	10 mg/mL/well (2/Pk)	PE0101-2MW
	96-well plate	30 mg/2 mL/well (2/Pk)	PE0302-2W

Cleanert PAX

Description

Cleanert PAX is an extraction cartridge that utilizes a water-wettable polymer with an anion exchange mixing mechanism as the matrix. It remains stable within a pH range of 0-14.0 and is used for extracting acidic compounds and their metabolites from biological matrices.

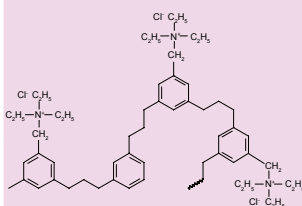
Parameters

Average particle size:
SPE cartridge: 55 µm
96 micro-well plate: 40 µm
96-well plate: 55 µm

Applicable Standards:

GB 23200.92-2016 National Food Safety Standards-Determination of Pentachlorophenol Residue in Animal-Derived Foods-Liquid Chromatography-Mass Spectrometry
GB 5009.185-2016 Determination of Patulin in Foods (Hawthorn Rolls/Apple Juice)
GB 5009.198-2016 Determination of Amnesic Shellfish Poisoning Toxins in Shellfish

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert PAX Mixed-Mode Anion Exchange Cartridge 	SPE Cartridge	10 mg/1 mL (100/Pk)	AX0101
		30 mg/1 mL (100/Pk)	AX0301
		60 mg/1 mL (100/Pk)	AX0601
		60 mg/3 mL (50/Pk)	AX0603
		100 mg/3 mL (50/Pk)	AX1003
		150 mg/3 mL (50/Pk)	AX1503
		200 mg/3 mL (50/Pk)	AX2003
		500 mg/3 mL (50/Pk)	AX5003
		150 mg/6 mL (30/Pk)	AX1506
		200 mg/6 mL (30/Pk)	AX2006
		500 mg/6 mL (30/Pk)	AX5006
		1 g/6 mL (30/Pk)	AX0006
		2 g/25 mL (15/Pk)	AX200025
	Sorbent	10 g/bottle	AX0010
		50 g/bottle	AX0050
		100 g/bottle	AX0100
		1000 g/bottle	AX1000
	96 micro-well plate	5 mg/mL/well (2/Pk)	AX00501-MW
		10 mg/mL/well (2/Pk)	AX0101-MW
	96-well plate	10 mg/2 mL/well (2/Pk)	AX0102-W
		30 mg/2 mL/well (2/Pk)	AX0302-W
		50 mg/2 mL/well (2/Pk)	AX0502-W

Cleanert PCX

Description

Cleanert PCX is an extraction cartridge based on a water-wettable polymer with a mixed-mode cation exchange mechanism. It provides dual retention modes: ion exchange and reversed-phase retention. The sorbent is stable across a pH range of 0-14.0 and has a large binding capacity. It is often used to extract and purify basic compounds from biological matrices (e.g., plasma, urine, bile, and tissue homogenates) that require high adsorption capacity.

Parameters

Average particle size:
 SPE Cartridge: 50 µm
 96 micro-well plate: 40 µm
 96-well plate: 50 µm
 Average pore size: 75 Å
 Specific surface area: 700 m²/g

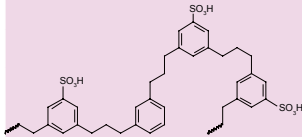
Applicable Standards:

GB 31658.5-2021 National Food Safety Standard-Determination of Florfenicol and Florfenicol Amine Residues in Animal Derived Food by Liquid Chromatography-Tandem Mass Spectrometry Method

GB 29694-2013 Determination of Sulfonamides Residues in Animal Derived Food by High Performance Liquid Chromatographic Method

SN/T 5118-2019 Determination of Melamine Residues in Live Animal and Feed for Import and Export-LC-MS/MS Method

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert PCX Mixed-mode Cation Exchange Cartridge 	SPE Cartridge	10 mg/1 mL (100/Pk)	CX0101
		30 mg/1 mL (100/Pk)	CX0301
		60 mg/1 mL (100/Pk)	CX0601
		30 mg/3 mL (50/Pk)	CX0303
		60 mg/3 mL (50/Pk)	CX0603
		100 mg/3 mL (50/Pk)	CX1003
		150 mg/3 mL (50/Pk)	CX1503
		200 mg/3 mL (50/Pk)	CX2003
		500 mg/3 mL (50/Pk)	CX5003
		100 mg/6 mL (30/Pk)	CX1006
		150 mg/6 mL (30/Pk)	CX1506
		200 mg/6 mL (30/Pk)	CX2006
		500 mg/6 mL (30/Pk)	CX5006
		2 g/12 mL (20/Pk)	CX200012
		2 g/25 mL (20/Pk)	CX200025
	Sorbent	10 g/bottle	CX0010
		50 g/bottle	CX0050
		100 g/bottle	CX0100
		1000 g/bottle	CX1000
	96 micro-well plate	5 mg/mL/well (2/Pk)	CX00501-MW
		10 mg/mL/well (2/Pk)	CX0101-MW
	96-well plate	30 mg/2 mL/well (2/Pk)	CX0302-W
		50 mg/2 mL/well (2/Pk)	CX0502-W

Cleanert PWAX

Description

Cleanert PWAX is an extraction cartridge based on a water-wettable polymer with a weak anion exchange mixing mechanism. It provides dual retention modes: ion exchange and reversed-phase retention. The sorbent is stable across a pH range of 0-14.0 and has a large binding capacity. It is often used to extract and purify basic compounds from biological matrices (e.g., plasma, urine, bile, and tissue homogenates) that require high adsorption capacity.

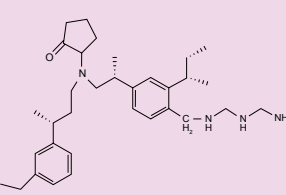
Parameters

Average particle size:
 SPE cartridge: 50 μm
 96 micro-well plate: 40 μm
 96-well plate: 50 μm
 Average pore size: 75 $\text{\AA}$
 Specific surface area: 700 m^2/g

Applicable Standards:

GB/T 5750.8-2023 Standard Test Methods for Drinking Water Part 8: Organic Matter Indicators

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert PWAX 	SPE Cartridge	30 mg/1 mL (100/Pk)	WA0301
		60 mg/1 mL (100/Pk)	WA0601
		60 mg/3 mL (50/Pk)	WA0603
		200 mg/3 mL (50/Pk)	WA2003
		500 mg/3 mL (50/Pk)	WA5003
		100 mg/6 mL (30/Pk)	WA1006
		150 mg/6 mL (30/Pk)	WA1506
		200 mg/6 mL (30/Pk)	WA2006
		500 mg/6 mL (30/Pk)	WA5006
		500 mg/12 mL (20/Pk)	WA50012
	Sorbent	10 g/bottle	WA0010
		100 g/bottle	WA0100
	96 micro-well plate	5 mg/mL/well (2/Pk)	WA00501-MW
		10 mg/mL/well (2/Pk)	WA0101-MW
	96-well plate	30 mg/2 mL/well (2/Pk)	WA0302-W
		50 mg/2 mL/well (2/Pk)	WA0502-W

Cleanert PWCX

Description

Cleanert PWCX is an extraction cartridge based on a water-wettable polymer with a weak cation exchange mixing mechanism. It provides dual retention modes: ion exchange and reversed-phase retention. The sorbent is stable across a pH range of 0-14.0 and has a large binding capacity. It is often used to extract and purify basic compounds from biological matrices (e.g., plasma, urine, bile, and tissue homogenates) that require high adsorption capacity.

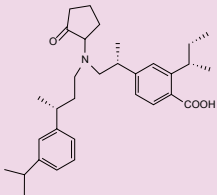
Parameters

Average particle size:
 SPE cartridge: 50 µm
 996 micro-well plate: 40 µm
 96-well plate: 50 µm
 Average pore size: 75 Å
 Specific surface area: 700 m²/g

Applicable Standards:

M 914-2017 Water Quality-Determination of Paraquat and Diquat-Solid Phase Extraction - High Performance Liquid Chromatography

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert PWCX 	SPE Cartridge	30 mg/1 mL (100/Pk)	WC0301
		60 mg/3 mL (50/Pk)	WC0603
		100 mg/3 mL (50/Pk)	WC1003
		200 mg/3 mL (50/Pk)	WC2003
		500 mg/3 mL (50/Pk)	WC5003
		150 mg/6 mL (30/Pk)	WC1506
		200 mg/6 mL (30/Pk)	WC2006
		500 mg/6 mL (30/Pk)	WC5006
	Sorbent	10 g/bottle	WC0010
		100 g/bottle	WC0100
	96 micro-well plate	2 mg/mL/well (2/Pk)	WC00201-MW
		5 mg/mL/well (2/Pk)	WC00501-MW
		10 mg/mL/well (2/Pk)	WC0101-MW
	96-well plate	30 mg/2 mL/well (2/Pk)	WC0302-W
		50 mg/2 mL/well (2/Pk)	WC0502-W

Cleanert LCX

Description

Cleanert LCX is a phosphorylated polystyrene-divinylbenzene polymer that provides dual retention modes: ion exchange and reversed-phase retention. The sorbent is stable across a pH range of 0-14.0 and has a large binding capacity.

Applicable Standards:

GB 31658.6-2021 National Food Safety Standard- Determination of Tetracyclines Residues in Animal Derived Food by High Performance Liquid Chromatography Method.

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert LCX	SPE Cartridge	500 mg/6 mL (30 pcs/box)	LCX5006

Cleanert PS

Description

Cleanert PS is an unsubstituted polystyrene/divinylbenzene extraction column. With a high specific surface area ($>600 \text{ m}^2/\text{g}$) and a polarity slightly stronger than that of silica-based C18 adsorbents, it exhibits high adsorption capacity for both non-polar and polar compounds, similar to macroporous adsorption resins. It is commonly used for the separation of natural products.

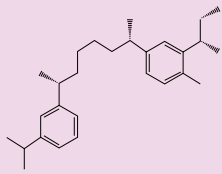
Parameters

Average particle size: $50 \text{ }\mu\text{m}$
 Average pore size: $75 \text{ }\text{\AA}$
 Specific surface area: $700 \text{ m}^2/\text{g}$

Applicable Standards:

GB 5009.243-2016 Determination of Heterocyclic Amines in High Temperature Cooked Foods

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert PS 	SPE Cartridge	60 mg/3 mL (50/Pk)	PS0603
		100 mg/3 mL (50/Pk)	PS1003
		200 mg/3 mL (50/Pk)	PS2003
		250 mg/3 mL (50/Pk)	PS2503
		150 mg/6 mL (30/Pk)	PS1506
		200 mg/6 mL (30/Pk)	PS2006
		500 mg/6 mL (30/Pk)	PS5006
		1 g/6 mL (30/Pk)	PS0006
	Sorbent	10 g/bottle	PS0010
		100 g/bottle	PS0100



Silica Matrix

Cleanert S C18 (Endcapped)

Description

Cleanert S C18 is a reversed-phase C18 extraction column based on high-purity spherical silica gel. Compared to ordinary C18 materials, spherical materials offer higher uniformity and a more stable flow rate. The high-purity silica gel surface prevents excessive adsorption of alkaline and polar substances, making it ideal for extracting low-concentration analytes.

This material features high bonding density, low loss, and a high recovery rate. It is primarily used for desalting drugs and their metabolites, proteins, DNA, and other macromolecular samples in blood, plasma, and urine, as well as for enriching organic substances in environmental water samples.

Parameters

Average particle size: 55 μm
Average pore size: 70 $\text{\AA}$
Specific surface area: 500 m^2/g

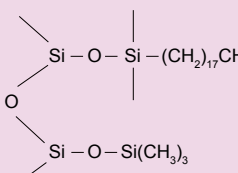
Applicable Standards:

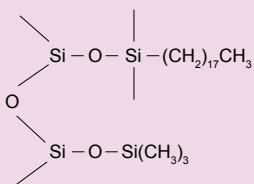
GB 31658.2-2021 Determination of Chloramphenicol Residues in Foods of Animal Origin - Liquid Chromatography-Tandem Mass Spectrometry

GB 23200.8-2016 Determination of 500 Pesticide Residues and Related Chemical Contaminants in Fruits and Vegetables - Gas Chromatography-Mass Spectrometry

GB 23200.9-2016 Determination of 475 Pesticide Residues and Related Chemical Contaminants in Grains - Gas Chromatography-Mass Spectrometry

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert S C18 (Endcapped) Spherical 	SPE Cartridge	50 mg/1 mL (100/Pk)	S180501
		100 mg/1 mL (100/Pk)	S181001
		300 mg/1 mL (100/Pk)	S183001
		60 mg/3 mL (50/Pk)	S180603
		100 mg/3 mL (50/Pk)	S181003
		200 mg/3 mL (50/Pk)	S182003
		250 mg/3 mL (50/Pk)	S182503
		300 mg/3 mL (50/Pk)	S183003
		500 mg/3 mL (50/Pk)	S185003
		1 g/3 mL (50/Pk)	S180003
		200 mg/6 mL (30/Pk)	S182006
		250 mg/6 mL (30/Pk)	S182506
		300 mg/6 mL (30/Pk)	S183006
		500 mg/6 mL (30/Pk)	S185006
		600 mg/6 mL (30/Pk)	S186006
		1 g/6 mL (30/Pk)	S180006
		2 g/6 mL (30/Pk)	S1820006
		500 mg/12 mL (20/Pk)	S1850012
		1 g/12 mL (20/Pk)	S1800012
		2 g/12 mL (20/Pk)	S18200012
		2 g/25 mL (15/Pk)	S18200025
		5 g/25 mL (15/Pk)	S18500025

Sorbent	Type	Unit	Part Number
Cleanert S C18 (Endcapped) Spherical 	Sorbent	10 g/bottle	S180010
		50 g/bottle	S180050
		100 g/bottle	S180100
		500 g/bottle	S180500
		1000 g/bottle	S181000
		2000 g/bottle	S182000
		3000 g/bottle	S183000
		5000 g/bottle	S185000
	96-well plate	30 mg/2 mL/well (2/Pk)	S180302-W
		50 mg/2 mL/well (2/Pk)	S180502-W
		100 mg/2 mL/well (2/Pk)	S181002-W

Cleanert S C18-N (Non-Endcapped)

Description

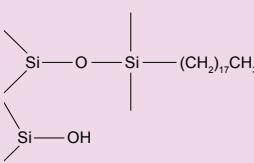
Cleanert S C18-N is a reversed-phase C18 extraction column based on high-purity spherical silica gel. Compared with conventional non-end-capped C18 materials, spherical materials offer superior uniformity and a more stable flow rate.

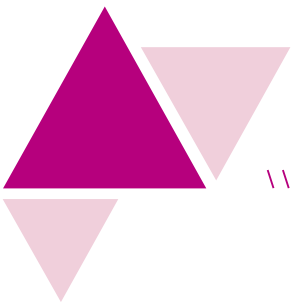
The increased presence of silanol functional groups on the surface provides additional polar interactions. Compared with end-capped adsorbents, it enhances the retention of basic compounds. It serves as a versatile stationary phase for extracting both polar and non-polar compounds.

Parameters

Average particle size: 55 μm
Average pore size: 100 $\text{\AA}$
Specific surface area: 300 m^2/g

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert S C18-N (Non-end-capped) 	SPE Cartridge	100 mg/1 mL (100/Pk)	S181001N
		100 mg/3 mL (50/Pk)	S181003N
		200 mg/3 mL (50/Pk)	S182003N
		500 mg/3 mL (50/Pk)	S185003N
		500 mg/6 mL (30/Pk)	S185006N
		1 g/6 mL (30/Pk)	S180006N
		1 g/12 mL (20/Pk)	S1800012N
		2 g/12 mL (20/Pk)	S18200012N
	Sorbent	10 g/bottle	S180010N
		100 g/bottle	S180100N
	96-well plate	50 mg/2 mL/well (2/Pk)	S180502-N-W
		100 mg/2 mL/well (2/Pk)	S181002-N-W



Cleanert S AQ C18 Hydrophilic Series

Description

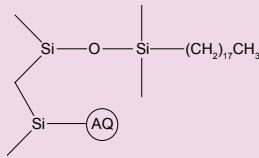
Ordinary C18, also known as octadecyl bonded silica gel, is a non-polar reversed-phase material. A drawback of this material is that if it is excessively dried during the activation process, it can significantly affect the recovery rate and stability of the target compounds. Especially when the polarity of the analytes is too high, the target compounds may penetrate through without being 100% effectively adsorbed by the material.

The new AQ C18 series features a non-polar material surface enhanced with a specific ratio of polar functional groups, greatly enhancing the material's adsorption capacity for polar target compounds, while also eliminating concerns about the impact on recovery rate due to drying during the activation process.

Parameters

Average particle size: 55 μm
 Average pore size: 100 $\text{\AA}$
 Specific surface area: 300 m^2/g

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert S AQ C18 	SPE Cartridge	100 mg/1 mL (100/Pk)	S181001-AQ
		200 mg/3 mL (50/Pk)	S182003-AQ
		500 mg/3 mL (50/Pk)	S185003-AQ
		500 mg/6 mL (30/Pk)	S185006-AQ
		1 g/6 mL (30/Pk)	S180006-AQ
		1 g/12 mL (20/Pk)	S1800012-AQ
		2 g/12 mL (20/Pk)	S18200012-AQ
		10 g/60 mL (20/Pk)	S181000060-AQ
	Sorbent	10 g/bottle	S180010-AQ
		100 g/bottle	S180100-AQ
	96-well plate	50 mg/2 mL/well (2/Pk)	S180502AQ-W
		100 mg/2 mL/well (2/Pk)	S181002AQ-W

Cleanert S C8

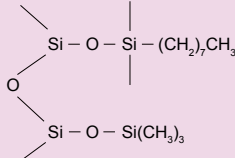
Description

Cleanert S C8 exhibits adsorption properties similar to C18 bonding, primarily relying on non-polar carbon bond interactions. However, due to its shorter carbon chain compared to C18, C8 demonstrates weaker retention of non-polar compounds, proving beneficial for eluting samples with excessive non-polar adsorption. C8 cartridges are capable of simultaneously extracting both fat-soluble and water-soluble vitamins from plasma and are frequently employed for desalting biological macromolecule samples.

Parameters

Average particle size: 55 μm
 Average pore size: 70 $\text{\AA}$
 Specific surface area: 500 m^2/g

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert S C18 	SPE Cartridge	100 mg/1 mL (100/Pk)	S081001
		200 mg/3 mL (50/Pk)	S082003
		500 mg/3 mL (50/Pk)	S085003
		500 mg/6 mL (30/Pk)	S085006
		1 g/6 mL (30/Pk)	S080006
		500 mg/12 mL (20/Pk)	S0850012
	Sorbent	10 g/bottle	S080010
		100 g/bottle	S080100
	96-well plate	50 mg/2 mL/well (2/Pk)	S080502-W
		100 mg/2 mL/well (2/Pk)	S081002-W

Cleanert Phenyl

Description

Cleanert Phenyl SPE products are phenyl extraction columns based on high-purity spherical silica gel with a short alkyl chain. They provide moderate hydrophobic and aromatic selectivity through π - π interactions and can be used for reversed-phase extraction.

Parameters

Average particle size: 55 μm ;
Average pore size: 100 Å
Specific surface area: 300 m^2/g

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert Phenyl	SPE Cartridge	500 mg/3 mL (50/Pk)	PH5003
		500 mg/6 mL (30/Pk)	PH5006
		1 g/6 mL (30/Pk)	PH0006

Cleanert CN

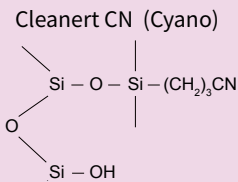
Description

Cleanert CN (Cyano) SPE products are cyanopropyl extraction columns based on high-purity spherical silica gel. They exhibit moderate polarity and can be used for reversed-phase or normal-phase extraction. Common applications include the extraction of drugs, drug metabolites, and pesticides such as antibiotics, dyes, herbicides, phenols, and steroids.

Parameters

Average particle size: 55 μm
Average pore size: 70 Å
Specific surface area: 500 m^2/g

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert CN (Cyano) 	SPE Cartridge	100 mg/1 mL (100/Pk)	CN1001
		200 mg/3 mL (50/Pk)	CN2003
		500 mg/3 mL (50/Pk)	CN5003
		500 mg/6 mL (30/Pk)	CN5006
		1 g/6 mL (30/Pk)	CN0006
	Sorbent	10 g/bottle	CN0010
		100 g/bottle	CN0100
		1000 g/bottle	CN1000

Cleanert NH₂

Description

Cleanert NH₂ (Amino) is an aminopropyl extraction column based on silica gel. It incorporates a polar stationary phase and a weak anion exchanger, enabling dual retention mechanisms through either weak anion exchange (in aqueous solutions) or polar adsorption (in nonpolar organic solvents). When pretreated in nonpolar solvents such as n-hexane, it forms hydrogen bonds with molecules containing -OH, -NH, or -SH functional groups. The amino group (pKa=9.8) exhibits weaker anion-binding capacity compared with SAX. In aqueous solutions with pH < 7.8, it functions as a weak anion exchanger, effectively removing strong anions (e.g., sulfonic acid ions) from samples.

Parameters

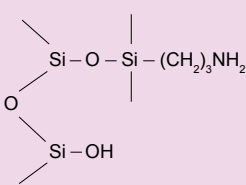
Average particle size: 55 µm
Average pore size: 60 Å
Specific surface area: 500 m²/g

Applicable Standards:

NY/T 761-2008 Pesticide Multiresidue Screen Methods for Determination of Organophosphorus, Pesticides, Organochlorine Pesticides, Pyrethroid Pesticides and Carbamate Pesticides in Vegetables and Fruits

GB/T 20769-2008 Determination of 450 Pesticides and Related Chemicals Residues in Fruits and Vegetables-LC-MS-MS Method

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert NH₂ (Amino) 	SPE Cartridge	100 mg/1 mL (100/Pk)	NH1001
		60 mg/3 mL (50/Pk)	NH0603
		100 mg/3 mL (50/Pk)	NH1003
		200 mg/3 mL (50/Pk)	NH2003
		250 mg/3 mL (50/Pk)	NH2503
		500 mg/3 mL (50/Pk)	NH5003
		150 mg/6 mL (30/Pk)	NH1506
		250 mg/6 mL (30/Pk)	NH2506
		500 mg/6 mL (30/Pk)	NH5006
		1 g/6 mL (30/Pk)	NH0006
		2 g/6 mL (30/Pk)	NH20006
		500 mg/12 mL (20/Pk)	NH50012
		1 g/12 mL (20/Pk)	NH00012
		2 g/12 mL (20/Pk)	NH200012
	Sorbent	10 g/bottle	NH0010
		100 g/bottle	NH0100
		1000 g/bottle	NH1000
		5000 g/bottle	NH5000

Cleanert PSA

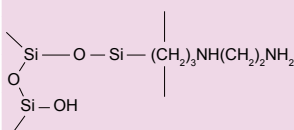
Description

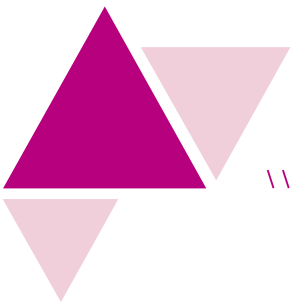
Cleanert PSA is a sorbent similar to NH_2 . PSA has two amino groups with pKa values of 10.1 and 10.9, giving it a stronger ion exchange capacity than the NH_2 column. Additionally, PSA can chelate with metal ions, making it suitable for extracting them. It is frequently used in sample pretreatment for pesticide residue analysis to remove organic acids, pigments, metal ions, and phenols.

Parameters

Average particle size: 55 μm
 Average pore size: 60 Å
 Specific surface area: 500 m^2/g

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert PSA N-Propylethylenediamine 	SPE Cartridge	100 mg/1 mL (100/Pk)	PA1001
		200 mg/3 mL (50/Pk)	PA2003
		500 mg/3 mL (50/Pk)	PA5003
		500 mg/6 mL (30/Pk)	PA5006
		1 g/6 mL (30/Pk)	PA0006
		1 g/6 mL (30/Pk) Glass column tube	PA0006-G
		2 g/12 mL (20/Pk)	PA200012
	Sorbent	10 g/bottle	PA0010
		50 g/bottle	PA0050
		100 g/bottle	PA0100
		500 g/bottle	PA0500
		1000 g/bottle	PA1000
		2000 g/bottle	PA2000
		5000 g/bottle	PA5000
		25 kg/bottle	PA025



Cleanert SAX

Description

Cleanert SAX is a strong anion exchange extraction column based on high-purity spherical silica gel and is bonded with quaternary ammonium functional groups. It is primarily used for extracting weak anionic compounds, such as carboxylic acids. The strong anion exchanger can extract negatively charged compounds from both aqueous and non-aqueous solutions, making it suitable for weak acid extraction. It is frequently employed to remove strong anions from samples, including organic acids, nucleic acids, nucleotides, sulfonic acid roots, and inorganic ions. Additionally, it is used for desalting biomacromolecules.

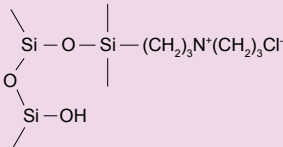
Parameters

Average particle size: 55 µm;
Average pore size: 70 Å
Specific surface area: 500 m²/g

Applicable Standards:

GB 5009.157-2016 Determination of Organic Acids in Foods

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert SAX Strong anion exchange 	SPE Cartridge	100 mg/1 mL (100/Pk)	SA1001
		60 mg/3 mL (50/Pk)	SA0603
		200 mg/3 mL (50/Pk)	SA2003
		500 mg/3 mL (50/Pk)	SA5003
		200 mg/6 mL (30/Pk)	SA2006
		500 mg/6 mL (30/Pk)	SA5006
		1 g/6 mL (30/Pk)	SA0006
		500 mg/12 mL (20/Pk)	SA50012
		1.5 g/12 mL (20/Pk)	SA150012
		2 g/12 mL (20/Pk)	SA200012
	Sorbent	10 g/bottle	SA0010
		100 g/bottle	SA0100
		500 g/bottle	SA0500
		1000 g/bottle	SA1000
		5000 g/bottle	SA5000
	96-well plate	50 mg/2 mL/well (2/Pk)	SA0502-W
		100 mg/2 mL/well (2/Pk)	SA1002-W

Cleanert SCX

Description

Cleanert SCX is a strong cation exchange extraction column based on high-purity spherical silica gel and bonded with benzenesulfonic acid functional groups. It is used to extract organic bases or for the desalination of biomolecules. When mixed with C18, it can also extract organic bases include: antibiotics, pharmaceuticals, organic bases, amino acids, catecholamines, herbicides, nucleic acid bases, nucleosides, and surfactants.

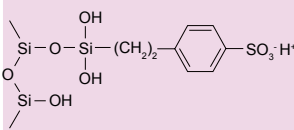
Parameters

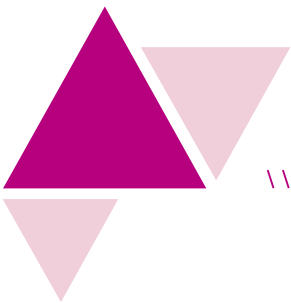
Average particle size: 55 μm
 Average pore size: 70 $\text{\AA}$
 Specific surface area: 500 m^2/g

Applicable Standards:

NY/T 1725-2009 Determination of Cyromazine Residue in Vegetables By HPLC

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert SCX Strong cation exchange 	SPE Cartridge	100 mg/1 mL (100/Pk)	SC1001
		60 mg/3 mL (50/Pk)	SC0603
		200 mg/3 mL (50/Pk)	SC2003
		500 mg/3 mL (50/Pk)	SC5003
		150 mg/6 mL (30/Pk)	SC1506
		200 mg/6 mL (30/Pk)	SC2006
		500 mg/6 mL (30/Pk)	SC5006
		1 g/6 mL (30/Pk)	SC0006
		2 g/6 mL (30/Pk)	SC20006
		1.5 g/12 mL (20/Pk)	SC150012
		5 g/25 mL (15/Pk)	SC500020
	Sorbent	10 g/bottle	SC0010
		100 g/bottle	SC0100
		500 g/bottle	SC0500
		1000 g/bottle	SC1000
		5000 g/bottle	SC5000
	96-well plate	50 mg/2 mL/well (2/Pk)	SC0502-W
		100 mg/2 mL/well (2/Pk)	SC1002-W



Cleanert COOH

Description

Cleanert COOH is a weak cation exchange extraction column based on high-purity spherical silica gel. The bonded functional group is carboxyl ($pK_a=3.8$). It is used to extract quaternary ammonium compounds or other strong cations.

Parameters

Average particle size: 50 μm
Average pore size: 54 $\text{\AA}$
Specific surface area: 680 m^2/g

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert COOH Carboxyl	SPE Cartridge	6 mg/3 mL (50/Pk)	CH0603
		100 mg/3 mL (50/Pk)	CH1003
		200 mg/3 mL (50/Pk)	CH2003
		500 mg/3 mL (50/Pk)	CH5003
		200 mg/6 mL (30/Pk)	CH2006
		500 mg/6 mL (30/Pk)	CH5006
	Sorbent	1 g/6 mL (30/Pk)	CH0006
		10 g/bottle	CH0010
		100 g/bottle	CH0100

Cleanert PRS

Description

Cleanert PRS is a strong cation exchange extraction column based on high-purity spherical silica gel. The bonded functional group is propyl sulfonic acid, which is slightly less acidic than SCX (benzene sulfonic acid). It is used to extract weak cations, such as pyridine, with a high recovery rate, and widely used in the pretreatment of malachite green samples.

Parameters

Average particle size: 55 μm
Average pore size: 100 $\text{\AA}$
Specific surface area: 300 m^2/g

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert PRS Propanesulfonic Acid	SPE Cartridge	100 mg/1 mL (100/Pk)	PR1001
		200 mg/3 mL (50/Pk)	PR2003
		500 mg/3 mL (50/Pk)	PR5003
		500 mg/6 mL (30/Pk)	PR5006
		1 g/6 mL (30/Pk)	PR0006
	Sorbent	10 g/bottle	PR0010
		100 g/bottle	PR0100

Cleanert SH

Description

Cleanert SH (Mercapto) is a mercapto extraction column based on silica gel. It is commonly used for detecting alkylmercury in environmental and water samples. Compared with national standard methods, it offers simpler operation and improved reproducibility.

Applicable Standards:

GB/T 14204-1993 Water Quality-Determination of Alkylmercury-Gas Chromatography

GB/T 17132-1997 Environment-Determination of Methylmercury-Gas Chromatography

Parameters

Particle size range: 200-300 mesh

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert SH Mercapto	SPE Cartridge	250 mg/6 mL (30/Pk)	SH2506
		500 mg/6 mL (30/Pk)	SH5006
		1 g/6 mL (30/Pk)	SH0006
	Sorbent	10 g/bottle	SH0010
		50 g/bottle	SH0050
		100 g/bottle	SH0100

Cleanert Silica

Description

Cleanert Silica is a polar extraction column that utilizes unbonded silica gel as sorbent. It exhibits weak acidity and high polarity, which is used to separate non-polar and weakly polar compounds, oils, etc., especially those with similar structures. It can also be used for the extraction of weak cationic compounds.

Parameters

Particle size range: 200-300 mesh

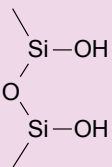
Average pore size: 60 Å

Specific surface area: 480 m²/g

Applicable Standards:

GB/T 22338-2008 Determination of Multi-Residues of Chloramphenicols in Animal-Original Food

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert Silica 	SPE Cartridge	100 mg/1 mL (100/Pk)	SI1001
		200 mg/3 mL (50/Pk)	SI2003
		500 mg/3 mL (50/Pk)	SI5003
		200 mg/6 mL (30/Pk)	SI2006
		500 mg/6 mL (30/Pk)	SI5006
		1 g/6 mL (30/Pk)	SI0006
		2 g/6 mL (30/Pk)	SI20006
		1 g/12 mL (20/Pk)	SI00012
		2 g/12 mL (20/Pk)	SI200012
		5 g/25 mL (15/Pk)	SI500025
		10 g/60 mL (10/Pk)	SI1000060
	Sorbent	10 g/bottle	SI0010
		50 g/bottle	SI0050
		100 g/bottle	SI0100
		500 g/bottle	SI0500
		1000 g/bottle	SI1000
	96-well plate	50 mg/2 mL/well (2/Pk)	SI0502-W
		100 mg/2 mL/well (2/Pk)	SI1002-W

Cleanert Diol

Description

Cleanert Diol is a diol-based extraction cartridge based on high-purity spherical silica gel. Through polar interactions, it extracts polar samples from non-polar solutions. Similar to unbonded silica gel, it forms hydrogen bonds with samples and, like silica gel cartridges, it can differentiate structurally similar compounds, such as isomers. Additionally, it can extract non-polar compounds because the carbon chains on its bonded phase provide sufficient non-polar forces to retain hydrophobic samples.

Parameters

Average particle size: 55 µm
Average pore size: 100 Å
Specific surface area: 300 m²/g

Applicable Standards:

GB/T 22338-2008 Determination of Multi-Residues of Chloramphenicols in Animal-Original Food

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert Diol Diol-based $\begin{array}{c} \\ \text{—Si—CH}_2\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH—CH}_2 \\ \qquad \qquad \qquad \quad \\ \qquad \qquad \qquad \text{OH} \quad \text{OH} \end{array}$	SPE Cartridge	200 mg/3 mL (50/Pk)	DI2003
		500 mg/3 mL (50/Pk)	DI5003
		500 mg/6 mL (30/Pk)	DI5006
		1 g/6 mL (30/Pk)	DI0006
	Sorbent	10 g/bottle	DI0010
		100 g/bottle	DI0100
		1000 g/bottle	DI1000

Cleanert C8/SCX

Description

Silica gel-based C8 and strong cation exchange columns are commonly used to extract basic drugs from urine and blood samples.

This product utilizes specially treated silica gel material with a surface uniformly bonded with non-polar C8 functional groups and strong cation exchange benzenesulfonic acid functional groups. This design incorporates two distinct adsorption principles, addressing the issues of excessive adsorption often encountered with C18 and C8 materials and the strong adsorption of SCX materials that can hinder sample elution.

Parameters

Average particle size: 55 µm
Average pore size: 70 Å
Specific surface area: 500 m²/g

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert C8/SCX Mixed Cation Exchange	SPE Cartridge	50 mg/1 mL (100/Pk)	CS0501
		130 mg/3 mL (50/Pk)	CS1303
		200 mg/3 mL (50/Pk)	CS2003
		300 mg/3 mL (50/Pk)	CS3003
		500 mg/3 mL (50/Pk)	CS5003
		500 mg/6 mL (30/Pk)	CS5006
		1000 mg/6 mL (30/Pk)	CS0006
	Sorbent	10 g/bottle	CS0010
		100 g/bottle	CS0100

Adsorption Matrix

Cleanert Florisil

Description

Cleanert Florisil is a highly selective sorbent composed of three primary components including silicon dioxide (84%), magnesium oxide (15.5%), and sodium sulfate (0.5%). It is a commonly used solid-phase extraction sorbent that is both effective and cost-efficient. Specifically designed for methods such as those from AOAC and EPA, it is used for the purification and separation of pesticide residues, the separation of endocrine substances and oils, and the separation of PCBs, PAHs, nitrogen-containing compounds in hydrocarbons, and antibiotic substances. It is often used to remove pigments in pesticide residue analysis and is an essential sample preparation cartridge in the NY/T 761 analytical method.

Parameters

Particle size range: 60-100 mesh
Average pore size: 80 Å
Specific surface area: 290 m²/g

Applicable Standards:

NY/T 761-2008 Pesticide Multiresidue Screen Methods for Determination of Organophosphorus, Pesticides, Organochlorine Pesticides, Pyrethroid Pesticides and Carbamate Pesticides in Vegetables and Fruits
GB/T 22338-2008 Determination of Multi-Residues of Chloramphenicols in Animal-Original Food
GB 5009.265-2021 National Food Safety Standard - Determination of Polycyclic Aromatic Hydrocarbons in Foods

Recommended Operating Procedures for Pesticide Residue Detection in Fruits and Vegetables

Activation: Precondition the Cleanert Florisil (1000 mg/6 mL, Cat. No. FS0006) column by sequentially eluting with 5.0 mL of acetone + n-hexane (10%+90%) and 5.0 mL of n-hexane.

Sample loading: Immediately pour the sample solution into the column when the solvent level reaches the surface of the adsorption layer.

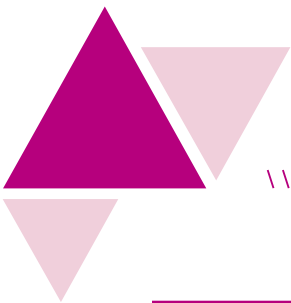
Elution: Collect the eluate into a 15 mL graduated centrifuge tube. Rinse the beaker with 5 mL of acetone + n-hexane (10%+90%) and elute the Florisil column. Repeat the elution step once.

Place the centrifuge tube containing the eluent on a nitrogen evaporator. Evaporate the solution to less than 5 mL at a water bath temperature of 50° C. Accurately dilute the solution to 5.0 mL using n-hexane.

Mix the solution thoroughly on a vortex mixer. Transfer the solution into two 2mL autosampler vials for analysis.

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert Florisil	SPE Cartridge	100 mg/1 mL (100/Pk)	FS1001
		100 mg/3 mL (50/Pk)	FS1003
		200 mg/3 mL (50/Pk)	FS2003
		250 mg/3 mL (50/Pk)	FS2503
		500 mg/3 mL (50/Pk)	FS5003
		1 g/3 mL (50/Pk)	FS0003
		500 mg/6 mL (30/Pk)	FS5006
		1 g/6 mL (30/Pk)	FS0006
		2 g/6 mL (30/Pk)	FS20006
		500 mg/12 mL (20/Pk)	FS50012
		1 g/12 mL (20/Pk)	FS00012
		2 g/12 mL (20/Pk)	FS200012
		5 g/25 mL (15/Pk)	FS500025



Sorbent	Type	Unit	Part Number
Cleanert Florisil	SPE Cartridge	5 g/30 mL (15/Pk)	FS500030
		2 g/60 mL (10/Pk)	FS200060
		10 g/60 mL (10/Pk)	FS1000060
		20 g/60 mL (10/Pk)	FS2000060
	Sorbent	10 g/bottle	FS0010
		100 g/bottle	FS0100
		500 g/bottle	FS0500
		1000 g/bottle	FS1000
		5000 g/bottle	FS5000
		20 kg/bottle	FS20000

Cleanert PestiCarb

Description

Cleanert PestiCarb utilizes a novel carbon black sorbent, providing exceptional purification, high recovery rates, and excellent reproducibility. It is widely used in pesticide residue analysis, especially in the pretreatment of samples with high pigments such as vegetables and fruits. It is often used to remove impurities such as pigments in pesticide residue analysis.

Parameters

Particle size range: 100-400 mesh

Applicable Standards:

SN/T 0654-2019 Determination of Captan Residues in Fruits for Export GC and GC-MS/MS Method

SN/T 0337-2019 Determination of Carbofuran and Its Metabolite Residues in Plant-Derived Food for Export HPLC-MS/MS Method

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert PestiCarb Graphitized Carbon	SPE Cartridge	50 mg/1 mL (100/Pk)	PC0501
		100 mg/1 mL (100/Pk)	PC1001
		60 mg/3 mL (50/Pk)	PC0603
		125 mg/3 mL (50/Pk)	PC1253
		150 mg/3 mL (50/Pk)	PC1503
		200 mg/3 mL (50/Pk)	PC2003
		250 mg/3 mL (50/Pk)	PC2503
		250 mg/6 mL (30/Pk)	PC2506
		500 mg/3 mL (50/Pk)	PC5003
		500 mg/6 mL (30/Pk)	PC5006
		1 g/6 mL (30/Pk)	PC0006
		1 g/12 mL (20/Pk)	PC00012
		2 g/12 mL (20/Pk)	PC200012
	Sorbent	5 g/bottle	PC0005
		10 g/bottle	PC0010
		25 g/bottle	PC0025
		50 g/bottle	PC0050
		100 g/bottle	PC0100
		500 g/bottle	PC0500
		1000 g/bottle	PC1000

Cleanert Alumina A

Description

Cleanert Alumina A acidic alumina solid phase extraction columns are packed with a material obtained by soaking neutral alumina in an acidic buffer solution. With a pH of 4.5, the surface of the alumina crystals is cationic, and anions can be adsorbed by the ion exchange mechanism. Therefore, they are suitable for the extraction of crude oil and can be used as medium cation exchanger.

Parameters

Particle size range: 100–200 mesh

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert Alumina A Acidic Alumina	SPE Cartridge	200 mg/3 mL (50/Pk)	AL2003-A
		500 mg/3 mL (50/Pk)	AL5003-A
		500 mg/6 mL (30/Pk)	AL5006-A
		1 g/3 mL (50/Pk)	AL0003-A
		1 g/6 mL (30/Pk)	AL0006-A
		2 g/12 mL (20/Pk)	AL200012-A
		3 g/12 mL (20/Pk)	AL300012-A
	Sorbent	10 g/bottle	AL0010-A
		100 g/bottle	AL0100-A
		100 g/bottle	AL1000A

Cleanert Alumina B

Description

Cleanert Alumina B alkaline alumina solid phase extraction columns are packed with a material obtained by soaking neutral alumina in an alkaline buffer solution. With a pH of 9.5, the surface of the alumina crystals becomes anionic, allowing the adsorption of cations through an ion exchange mechanism. Therefore, they are suitable for removing organic acids, phenols, and similar compounds.

Parameters

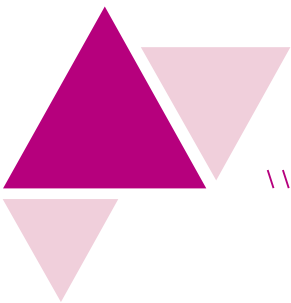
Particle size range: 100–200 mesh

Applicable Standards:

SN/T 1979-2019 Determination of Praziquantel Residue in Foodstuffs of Animal Origin for Import and Export-LC-MS/MS Method

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert Alumina B Alkaline Alumina	SPE Cartridge	100 mg/1 mL (100/Pk)	AL1001-B
		200 mg/3 mL (50/Pk)	AL2003-B
		250 mg/3 mL (50/Pk)	AL2503-B
		500 mg/3 mL (50/Pk)	AL5003-B
		1 g/3 mL (50/Pk)	AL0003-B
		500 mg/6 mL (30/Pk)	AL5006-B
		1 g/6 mL (30/Pk)	AL0006-B
		2 g/6 mL (30/Pk)	AL20006-B
		1 g/12 mL (20/Pk)	AL00012-B
		2 g/12 mL (20/Pk)	AL200012-B
		20 g/60 mL (10/Pk)	AL2000060-B
	Sorbent	10 g/bottle	AL0010-B
		100 g/bottle	AL0100-B
		500 g/bottle	AL0500-B
	96-well plate	50 mg/2 mL/well (2/Pk)	AL0502-B-W
		100 mg/2 mL/well (2/Pk)	AL1002-B-W



Cleanert Alumina N

Description

Cleanert Alumina N neutral alumina extraction columns have a pH of 7.5 and are strong polar adsorbents. The neutral surface readily retains heterocycles (containing nitrogen, phosphorus, and sulfur groups), aromatic hydrocarbons, and electron-rich compounds like organic amines. These columns undergo specialized deactivation to ensure high sample recovery rate. Applications include sample preparation for vitamins, antibiotics, aromatic oils, enzymes, glycosides, hormones, and more. They are widely used in the pretreatment of Sudan Red and Malachite Green samples.

Parameters

Particle size range: 100–200 mesh

Applicable Standards:

GB/T 19857-2005 Determination of Malachite Green and Crystal Violet Residues in Aquatic Product

GB 31660.1-2019 Determination of Macrolides Residues in Fishery Products by Liquid Chromatography-Tandem Mass Spectrometric Method

GB/T 19681-2005 The Method for The Determination of Sudan Dyes in Foods - High Performance Liquid Chromatography

Ordering Information

Sorbent	Type	Unit	Part Number
Cleanert Alumina N Neutral Alumina	SPE Cartridge	100 mg/1 mL (100/Pk)	AL1001-N
		100 mg/3 mL (50/Pk)	AL1003-N
		125 mg/3 mL (50/Pk)	AL1253-N
		200 mg/3 mL (50/Pk)	AL2003-N
		250 mg/3 mL (50/Pk)	AL2503-N
		500 mg/3 mL (50/Pk)	AL5003-N
		1 g/3 mL (50/Pk)	AL0003-N
		500 mg/6 mL (30/Pk)	AL5006-N
		1 g/6 mL (30/Pk)	AL0006-N
		2 g/6 mL (30/Pk)	AL20006-N
		1 g/12 mL (20/Pk)	AL00012-N
		2 g/12 mL (20/Pk)	AL200012-N
		3 g/12 mL (20/Pk)	AL300012-N
		4 g/12 mL (20/Pk)	AL400012-N
		5 g/12 mL (20/Pk)	AL500012-N
		6 g/12 mL (20/Pk)	AL600012-N
		3 g/25 mL (15/Pk)	AL300025-N
		4 g/25 mL (15/Pk)	AL400025-N
		5 g/25 mL (15/Pk)	AL500025-N
		10 g/30 mL (15/Pk)	AL1000030-N
		10 g/60 mL (10/Pk)	AL1000060-N
	Sorbent	10 g/bottle	AL0010-N
		100 g/bottle	AL0100-N
		1000 g/bottle	AL1000N
		5000 g/bottle	AL5000-N

Cleanert IC Ion Chromatography Preparation Column

Product Name		Average Particle Size	Exchange Capacity	Applications	Unit	Part Number
IC-ODS	Reversed-phase C18 sorbent	40 µm	—	Removal of hydrophobic compounds; not suitable for sample solutions with excessively high or low pH.	1 cc (50/Pk) 2.5 cc (50/Pk)	IC-1810 IC-1825
IC-RP	Polystyrene/divinylbenzene polymer	40 µm	—	Removal of hydrophobic compounds, especially unsaturated and aromatic compounds. Suitable pH range: 0-14.0	1 cc (50/Pk) 2.5 cc (50/Pk)	IC-RP10 IC-RP25
IC-P	Pyrrolidone-substituted polyethylene/divinylbenzene polymer	40 µm	—	Featuring the function of RP column while exhibiting good selectivity for polar substances.	1 cc (50/Pk) 2.5 cc (50/Pk)	IC-P10 IC-P25
IC-A	Bicarbonate-based strong base anion exchange resin	40 µm	0.7 meq/1 cc	Removal of anionic contaminants and neutralizing the strong acidity of the sample solution.	1 cc (50/Pk) 2.5 cc (50/Pk)	IC-A10 IC-A25
IC-H	H-type strong acid cation exchange resin	40 µm	2.0-2.2 meq/1 cc	Removal of alkaline earth metal ions, transition metal ions, and carbonate ions from the sample matrix, and neutralizing the strong alkalinity of the sample solution.	1 cc (50/Pk) 2.5 cc (50/Pk)	IC-H10 IC-H25
IC-Na	Na-type strong acid cation exchange resin	40 µm	2.0-2.2 meq/1 cc	Removal of alkaline earth metal ions and transition metal ions from the sample matrix.	1 cc (50/Pk) 2.5 cc (50/Pk)	IC-Na10 IC-Na25
IC-Ag	Ag-type strong acid cation exchange resin	40 µm	2.0-2.2 meq/1 cc	Removal of Cl ⁻ , Br ⁻ , I ⁻ , AsO ₄ ³⁻ , CrO ₄ ²⁻ , CN ⁻ , MoO ₄ ²⁻ , PO ₄ ³⁻ , SeO ₃ ²⁻ , SO ₃ ²⁻ , SCN ⁻ , S ²⁻ , SCN ⁻ and WO ₄ ²⁻ ions.	1 cc (50/Pk) 2.5 cc (50/Pk)	IC-Ag10 IC-Ag25
IC-Ba	Ba-type strong acid cation exchange resin	40 µm	2.0-2.2 meq/1 cc	Removal of SO ₄ ²⁻ , Activation with a solution containing Cl ⁻ is required in case of low anion concentration in the sample.	1 cc (50/Pk) 2.5 cc (50/Pk)	IC-Ba10 IC-Ba25
IC-M	Amino-type chelating resin	40 µm	0.4 meq/1 cc	Removal of transition metals, alkali metals, and alkaline earth metals.	1 cc (50/Pk) 2.5 cc (50/Pk)	IC-M10 IC-M25
IC-Ag/H	Ag/H-type strong acid cation exchange resin composite	40 µm	Functionally equivalent to the use of Ag and H columns in series.		1 cc (50/Pk) 2.5 cc (50/Pk)	IC-AgH10 IC-AgH25
IC-Ag/Na	Ag/Na-type strong acid cation exchange resin composite	40 µm	Functionally equivalent to the use of Ag and Na columns in series.		1 cc (50/Pk) 2.5 cc (50/Pk)	IC-AgNa10 IC-AgNa25
IC-Ba/Ag/H	Ba/Ag/H-type strong acid cation exchange resin composite	40 µm	Functionally equivalent to the use of Ba, Ag, and H columns in series.		1 cc (50/Pk) 2.5 cc (50/Pk)	IC-Ba/Ag/H10 IC-Ba/Ag/H25

Immunoaffinity Column

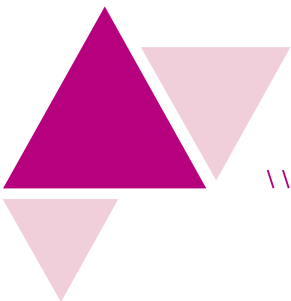
Based on the antigen-antibody reaction, the specific antibody is attached inside the column, selectively adsorbs the analyte to be detected, impurities are not adsorbed and flow out of the column, the target bound on the column is then washed down by the specific eluent, which can be used for liquid chromatography (HPLC) analysis or ELISA content determination, it is a kind of high-efficient pre-treatment column.

Product Name	Specification	Test Item	Column Capacity	Part Number
Total Aflatoxin (B1, B2, G1, G2) Immunoaffinity Column	25/Pk; 1 mL	Grain, oil, nuts, feed, Chinese herbal medicine, tea leaves, etc.	≥ 200 ng	BAC09001-X
Total Aflatoxin (B1, B2, G1, G2) Immunoaffinity Column	20/Pk; 3 mL	Grain, oil, nuts, feed, Chinese herbal medicine, tea leaves, etc.	≥ 300 ng	BAC09001-3-X
Aflatoxin B1 Immunoaffinity Column	25/Pk; 1 mL	Grain, oil, nuts, feed, Chinese herbal medicine, tea leaves, etc.	≥ 200 ng	BAC09002-X
Aflatoxin B1 Immunoaffinity Column	20/Pk; 3 mL	Grain, oil, nuts, feed, Chinese herbal medicine, tea leaves, etc.	≥ 300 ng	BAC09002-3-X
Aflatoxin M1 Immunoaffinity Column	25/Pk; 1 mL	Dairy products	≥ 100 ng	BAC09003-X
Aflatoxin M1 Immunoaffinity Column	20/Pk; 3 mL	Dairy products	≥ 150 ng	BAC09003-3-X
Total Aflatoxin (B1, B2, G1, G2, M1, M2) Immunoaffinity Column	25/Pk; 1 mL	Grain, oil, nuts, feed, Chinese herbal medicine, tea leaves, dairy products, etc.	-	BAC09004
Total Aflatoxin (B1, B2, G1, G2, M1, M2) Immunoaffinity Column	15/Pk; 3 mL	Grain, oil, nuts, feed, Chinese herbal medicine, tea leaves, dairy products, etc.	-	BAC09004-3
T2 Toxin Immunoaffinity Column	25/Pk; 1 mL	Food, grains, feed, seasonings, etc.	≥ 750 ng	BAC10001-19
T2 Toxin Immunoaffinity Column	15/Pk; 3 mL	Food, grains, feed, seasonings, etc.	≥ 1000 ng	BAC10001-3-15
T2 Toxin Immunoaffinity Column	20/Pk; 3 mL	Food, grains, feed, seasonings, etc.	≥ 1000 ng	BAC10001-3-19
Vomitoxin Immunoaffinity Column	25/Pk; 1 mL	Food, grains, feed, seasonings, etc.	≥ 750 ng	BAC10002-19
Vomitoxin Immunoaffinity Column	20/Pk; 3 mL	Food, grains, feed, seasonings, etc.	≥ 1200 ng	BAC10002-3-X
Zearalenone Immunoaffinity Column	25/Pk; 1 mL	Food, grains, feed, seasonings, etc.	≥ 500 ng	BAC10003-19
Zearalenone Immunoaffinity Column	20/Pk; 3 mL	Food, grains, feed, seasonings, etc.	≥ 1500 ng	BAC10003-3-X
Fumonisin (B1, B2, B3) Immunoaffinity Column	25/Pk; 1 mL	Food, grains, feed, etc.	≥ 2500 ng	BAC10004-19
Fumonisin (B1, B2, B3) Immunoaffinity Column	20/Pk; 3 mL	Food, grains, feed, etc.	≥ 5000 ng	BAC10004-3-19
Ochratoxin A Immunoaffinity Column	25/Pk; 1 mL	Grains, peanuts, feed, wine, seasonings, etc.	≥ 100 ng	BAC10005-19
Ochratoxin A Immunoaffinity Column	20/Pk; 3 mL	Grains, peanuts, feed, wine, seasonings, etc.	≥ 300 ng	BAC10005-3-X
Citrinin Immunoaffinity Column	15/Pk; 3 mL	Food, grains, feed, etc.	≥ 500 ng	BAC10007-3
Biotin Immunoaffinity Column	15/Pk; 3 mL	Dairy products	≥ 1000 ng	BAC11015-3
Tetrodotoxin Immunoaffinity Column	20/Pk; 3 mL	Aquatic products	≥ 1000 ng	BAC30015-3-19
Vitamin B12 Immunoaffinity Column	20/Pk; 3 mL	Dairy products	≥ 800 ng	BAC12015-3-X
Heparin Immunoaffinity column	20/Pk; 12 mL	Pasteurized milk, formulated milk, dairy beverages, formulated milk powder and milk based infant formula, fermented milk, etc	≥ 2 mg	BAC50020-12

Solid Phase Extraction Accessories and Devices

SPE Empty Tubes and Frits

Product Name	Unit	Part Number	Picture
Flanged SPE Tube	1 mL (100/Pk)	AZ001-H	
	3 mL (100/Pk)	AZ003	
	6 mL (100/Pk)	AZ006	
	12 mL (100/Pk)	AZ012	
	25 mL (50/Pk)	AZ030	
	60 mL (50/Pk)	AZ060	
	150 mL (25/Pk)	AZ150	
Tabless Round-Edge Tube	6 mL (100/Pk)	AZ006-N	
LRC Specialty Tube	10 mL (100/Pk)	LAZ010	
Frits	Bottom frits for 1 mL tube, 10 µm (100/Pk)	AS001-A	
	Top frits for 1 mL tube, 20 µm (100/Pk)	AS001-A-2	
	Bottom frits for 3 mL tube, 10 µm (100/Pk)	AS003-A	
	Top frits for 3 mL tube, 20 µm (100/Pk)	AS003-A-2	
	Bottom frits for 6 mL tube, 10 µm (100/Pk)	AS006-A	
	Top frits for 6 mL tube, 20 µm (100/Pk)	AS006-A-2	
	Bottom frits for 12 mL tube, 10 µm (100/Pk)	AS012-A	
	Top frits for 12 mL tube, 20 µm (100/Pk)	AS012-A-2	
	Bottom frits for 25 mL tube, 10 µm (50/Pk)	AS030-A	
	Top frits for 25 mL tube, 20 µm (50/Pk)	AS030-A-2	
	Bottom frits for 60 mL tube, 10 µm (50/Pk)	AS060-A	
	Top frits for 60 mL tube, 20 µm (50/Pk)	AS060-A-2	
	Bottom frits for 150 mL tube, 10 µm (25/Pk)	AS150-A	
	Top frits for 150 mL tube, 20 µm (25/Pk)	AS150-A-2	
	Bottom frits for 10 mL LRC tube, 10 µm	LAS010-A	
	Top frits for 10 mL LRC tube, 20 µm	LAS010-A-2	
Universal Adapter	Suitable for 1 mL, 3 mL, 6 mL, and 12 mL SPE tubes (12/Pk).	A80215	
	Suitable for 25 mL and 60 mL SPE tubes (6/Pk).	ZJT-1	
IC Column Tube with Filter Head	1 mL IC column with two frits (100/Pk).	AZ-IC-1T	
	2 mL IC column with two frits (100/Pk).	AZ-IC-2T	
	2.5 mL IC column with two frits (100/Pk).	AZ-IC-2.5T	



96-Well Collection Plates and Silicone Sealing Mats

Product Name	Specification	Part Number	Matching Silicone Cover	Picture
96-Well Collection Plate	1 mL, 8x12 well plate, square wells with round bottom (20/Pk).	96SP1036-20	96GP2036	
	1.5 mL, 8 x 12 well plate, square wells with round bottom (1/Pk)	96SP2036-1	96GP2036	
	2.2 mL, 8 x 12 well plate, square wells with round bottom (10/Pk, individually packaged)	96SP2036-2S	96GP2036	
	2.2 mL, 8 x 12 well plate, square wells with round bottom (10/Pk)	96SP2036-2	96GP2036	
	0.2 mL, 8 x 12 well plate, round wells with U-shaped bottom (10/Pk)	96SP0236-U	96GP2036-M	
	0.2 mL, 8 x 12 well plate, round wells with V-shaped bottom (10/Pk)	96SP0236-V	96GP2036-M	
	0.7 mL, 8 x 12 well plate, round wells with V-shaped bottom (50/Pk)	96SP0736-V	96GP2036-M	
	1 mL, 8 x 12 well plate, round wells with round bottom (10/Pk)	96SP1036-Y	96GP2036-M	
	2 mL, 8 x 12 well plate, round wells with round bottom (10/Pk)	96SP2036-Y	96GP1036-M	
96-well Waste Collection Plate	195 mL, 10/Pk	96WSP	/	
	290 mL, 50/Pk	96WSP-H	/	

Large Volume Loading Tubes/Devices

Product Name	Specification	Part Number	Picture
Large-volume Loading Tube	30 mL (includes universal adapter A80215), (1/Pk)	A82030	
	60 mL (includes universal adapter A80215), (1/Pk)	A82060	
Large-volume Sampler	Adapter with 1 m Teflon hose (suitable for 1-12 mL), (1/Pk)	A80116	
	Adapter with 2 m Teflon hose (suitable for 6 mL glass column tube), (1/Pk)	A80116-T	
	Adapter with 2 m Teflon hose (suitable for 1-12 mL), (1/Pk)	A80116-C	



12/24 Position Vacuum Manifold Set and Accessories

Description

A negative pressure SPE extraction device has been introduced, which provides a continuous parallel condition for the sample pretreatment process and simplifies the complex treatment process. The vacuum chamber design saves processing time.

Our company offers two specifications of the negative pressure SPE device: 12-position and 24-position. Both are sold as complete sets. Please refer to the ordering information for available spare parts.

Main Components

Vacuum Panel:

Made of rigid and deformation-resistant material. The vacuum panel features waterproof Luer needle hub and plugs, and comes with a panel bracket.

Glass Chamber:

The transparent glass chamber allows for real-time monitoring of the extraction process and is easy to clean. It is equipped with a pressure relief valve and a vacuum pressure gauge to control the pressure within the chamber during extraction.

Sealing Mat:

Providing a secure seal between the vacuum panel and the glass chamber.

Stopcock Regulating Valve:

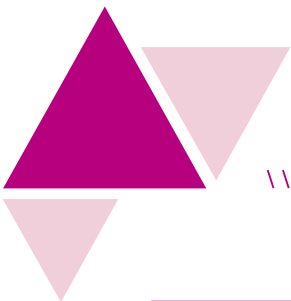
Connects between the upper Luer needle hub and the SPE cartridge, used to precisely control the flow rate of each cartridge. The guiding needle connects to the lower Luer needle hub.

Collection Bracket:

The collection bracket consists of a base plate, a groove plate, three brackets, four collection plates for different collection containers, and a plastic waste tank. The brackets are secured to the plates with fixing clips.

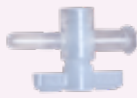
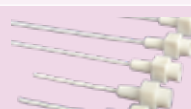
Optional components include a column adapter, buffer bottle, large-volume sampler, oil-free diaphragm vacuum pump, and nitrogen evaporator assembly.





Product Name	Description	Unit	Part Number
Solid Phase Extraction Vacuum Device	Standard Configuration of the 12-Position Solid Phase Extraction Vacuum Device: 1. Solid phase extraction glass chamber (1 pcs), pre-installed with one pressure relief valve and one vacuum pressure gauge. 2. Plastic panel of solid phase extraction chamber (1 pcs), pre-installed with twelve Luer upper needle hubs, twelve Luer lower needle hubs, and twelve dust plugs. 3. spare sealing gasket for panel (1 pcs); spare Luer upper needle hubs (12 pcs); spare Luer lower needle hubs (4 pcs); spare dust plugs (2 pcs). 4. Plastic flow rate regulating valves (12 pcs). 5. Plastic waste liquid tank (1 pcs). 6. Plastic guiding needles (12 pcs). 7. Plastic test tube rack (1 set), including six panels and three brackets. 8. Plastic C-type fixing clip (12 pcs) 9. Panel bracket (4 pcs)	1 set	VM12
	Standard configuration of the 24-position solid phase extraction vacuum device: 1. Solid phase extraction glass chamber (1 pcs), pre-installed with one pressure relief valve and one vacuum pressure gauge. 2. Plastic panel of solid phase extraction chamber (1 pcs), pre-installed with 24 Luer upper needle hubs, 24 Luer lower needle hubs, and 24 dust plugs. 3. Spare sealing pad for panel (1 pcs); spare Luer upper needle hub (4 pcs); spare Luer lower needle hub (6 pcs); spare dust plug (4 pcs). 4. Plastic flow regulating valve (24 pcs) 5. Plastic waste liquid tank (1 pcs). 6. Plastic guiding needle (24 pcs) 7. Plastic test tube rack (1 set), including four panels and three brackets. 8. Plastic C-type fixing clip (12 pcs) 9. Panel bracket (4 pcs)	1 set	VM24

Ordering Information for Partial Accessories

Product Name	Unit	Part Number	Picture
Flow Rate Regulating Valve	12/Pk	A81213	
Through-Panel Guiding Needle	12/Pk	A80100	
Oil-Free Diaphragm Vacuum Pump	1 unit	A01003	—
Through-Panel Guiding Needle (Extended)	12/Pk	A80100-L	—
Luer Upper Needle Hub	12/Pk	A80104	
Luer Lower Needle Hub	12/Pk	A80105	

China Headquarters

179 South Street, Teda West Zone
Tianjin 300462, China
Tel: +86 022-25321032
Fax: 022-25321033
Email: cninfo@phenomenex.com
Hotline: 400-606-8099

Global Headquarters

411 Madrid Avenue
Torrance, CA 90501-1430, USA
Tel: +1 (310) 212-0555
Fax: +1 (310) 328-7768
Email: info@phenomenex.com

**Trademarks**

Cleanert is trademark of Agela.

Disclaimer

FOR RESEARCH USE ONLY. Not for use in clinical diagnostic procedures.

© 2025 Tianjin Bonna-Agela Technologies Co., Ltd. All rights reserved.

